STANHOPE-SETA

Fuels
Biofuels
Petroleum feedstock
Crude oil
Chemicals
Lubricants
Cosmetics
Paints and varnishes
Bitumens
Recycled product

Laboratory instruments

for quality control, analysis and calibration

STANHOPE-SETA

www.stanhope-seta.co.uk

Laboratory instruments for quality control, analysis and calibration

Stanhope-Seta design and manufacture quality control instruments used to measure the physical characteristics that determine product quality and consistency. Seta instruments are used by many diverse industries including oil refining, petrochemical, lubricants, pharmaceutical, food, cosmetics, plastics and transport.

SetaAnalytics

www.seta-analytics.com

Analytical solutions for hydrocarbon petroleum products

Seta Analytics provide analytical solutions for Hydrocarbon Petroleum products. It is a division of Stanhope-Seta which combines long established experience of testing petroleum products with the latest measurement technologies to provide enhanced analytical solutions for exploration, refining, petrochemical, distribution and marketing operations.

Current developments include laser based measurement for particle counting, electrochemical sensors for H2S detection and miniature FTIR technology for low level detection of FAME in Jet Fuels.

seta biofuel testing

www.biofueltesting.com

Test instruments for biofuels analysis

Many Seta instruments are suitable for testing bio fuels including 100% FAME (B100), Bio Blends and fuels containing other oxygenates. Look for the Seta Bio logo in this catalogue.

Contents

Information at a glance

For ease of use the following icons are used throughout this catalogue

Bio-Fuel testing

Software included

Test certificates available for this product

Calibration and verification materials available

'Setalert' remote monitoring compatible

'SetaPlus' extended warranty available

Technical datasheets available

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SETA

Fuel Specifications Table

Stanhope-Seta also manufacture instruments to measure products other than fuels, including oils, greases, lubricants and LPG

	Jet A-1 Def Stan 91-91	Aviation Turbine Fuel ASTM D1655	Diesel EN 590	Diesel ASTM D975	Motor Gasoline EN 228	Motor Gasoline ASTM D4814	Aviation Gasoline ASTM D910	Fuel Oil ISO 8217	Bio-Heating Fuels EN 14213	Bio-Auto Fuels EN 14214	Bio-Fuel Blend Stock B100 ASTM D6751
Density	ASTM D1298 IP160	ASTM D1298	ISO 3675 IP 160		ISO 3675 IP 160		ASTM D1298	ISO 3675 IP 160	ISO 3675 IP 160	ISO 3675 IP 160	
Flash Point	IP 170 IP 523, 524 ASTM D3828 ASTM D56	ASTM D56 D3828	ISO 2719 IP 34	ASTM D93				ISO 2719 IP 34	ISO 3679 IP 523, 524	ISO 3679 IP 523, 524	ASTM D3828
Distillation	IP 123 ASTM D86	ASTM D86	ISO 3405 IP 123	ASTM D86 ASTM D3828	ISO 3405 IP 123	ASTM D86	ASTM D86				
Sulfur	IP 107 IP 243 ASTM D1266	ASTM D1266				ASTM D1266	ASTM D1266				
Colour	ASTM D156 ASTM D6045										
Freezing Point	IP 16 ASTM 2386	ASTM D2386					ASTM D2386				
Cloud Point			EN 23015 IP 219	ASTM D2500							D2500
CFPP			EN 116 IP 309	ASTM D6371					EN 116 IP 309		
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Existent Gum	IP 131 ASTM D381	ASTM D381	ISO 6246 IP 131		ISO 6246 IP 131	ASTM D381					
Aromatics	IP 156 ASTM D1319	ASTM D1319		ASTM D1319	IP 156 ASTM D1319						
Carbon Residue			ISO 10370 IP 398					ISO 10370 IP 398	ISO 10370 IP 398	ISO 10370 IP 398	D4530
Cetane Number*			EN 15195 IP 498	ASTM D6890					EN 15195 IP 498	EN 15195 IP 498	ASTM D6890
Vapour Pressure					EN 13016-1 IP 394	ASTM D5191	ASTM D323 ASTM D5191				
Oxidation Stability					ISO 7536 IP 40	ASTM D525	ASTM D873				
Ramsbottom Carbon Residue				ASTM D524							
Water and Sediment				ASTM D2709							D2709
Water								ISO 3733 IP 74			
Total Sediment								ISO 10307 IP 375			
Ash				ASTM D482					ISO 3987	ISO 3987	ASTM D874
Hydrogen sulfide (H_2S)								IP 570			
Particulates	IP 565										

This table only reflects the core test methods for fuels. Instruments for additional tests are detailed in the Seta Catalogue and on the website.

Feature Products

H_2S Analyser

COMPOSITION P88

Measurement of H_2S in liquid petroleum products

Setaflash Series 8

FLASHPOINT P11

Automatic small scale flashpoint testing

FIJI – Fame in Jet

COMPOSITION P89

Rapid screening method to analyse jet fuels

TOST Baths

OXIDATION P72

Range of 6 and 12 way solid block and oil baths

Multiflash

FLASHPOINT P2

Multi-mode automated flashpoint testing

Setavap2

VAPOUR PRESSURE P23

Rapid automated vapour pressure testing

Multi Filtration Tester

FILTER BLOCKING TENDENCY P83

Portable testing for the filterability/blocking tendency

AvCount

PARTICULATES P81

Laser based particle counter for aviation fuel, biodiesel, gasoline and diesel

Ignition Quality Tester

CETANE P110

Rapid determination of cetane number

Cloud & Pour Cryostat

CLOUD & POUR POINT P50

Flexible, compact refrigeration for cold tests

Seta Centrifuge

WATER CONTENT P108

Heated centrifuge with optional hazard reduction system

Setaflash Series 3

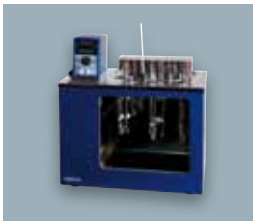
FLASHPOINT P12

Rapid and portable flashpoint testing

Existent Gum Bath

GUM CONTENT P87

Compact 5-place solid block bath with integral superheater



KV-6 Bath

VISCOSITY P37

Compact, high quality bath for all Kinematic measurements

Seta MTVM

REFERENCE MATERIAL P150

Traceable validation to ASTM/CEN/ISO/IP and equivalent test procedures

Seta-Shell 4 Ball

TRIBOLOGY P98

Determines the friction and wear properties of oil and greases

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1

MODULAR FLASH POINT TESTER

MULTIFLASH AUTOMATIC MULTI METHOD FLASH POINT TESTER (PENSKY-MARTENS, ABEL, TAG, CLEVELAND & SMALL SCALE)

Multiflash is a universal fully automated instrument designed for testing the flash point of fuels, lubricating oils, solvents, chemicals, waste materials and many other substances.

The instrument comprises a universal base unit that houses the display, control and data acquisition functions, and a series of interchangeable modules that allow the implementation of the required standard test methods.

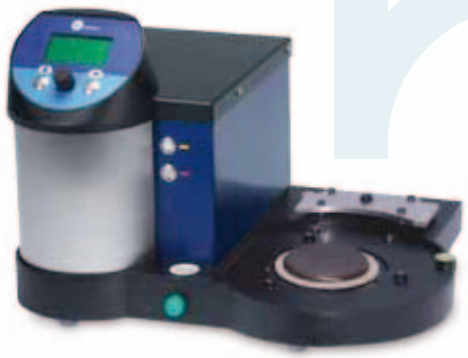
Multiflash is ruggedly designed to provide simple and reliable operation and is specifically engineered to ensure a very low cost of maintenance.

BIO-FUEL TESTING

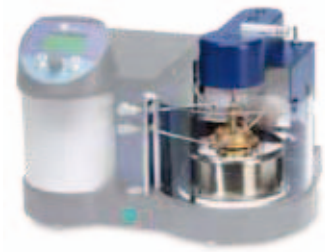
CALIBRATION & VERIFICATION MATERIALS

SETALERT COMPATIBLE

TECHNICAL DATASHEETS AVAILABLE



34000-0 UNIVERSAL BASE UNIT



PENSKY-MARTENS (A, B & C Closed Cup)

ASTM D93; E502; IP 34; IP 404 (obs); BS 2000 Parts 34 & 404 (obs); ISO 15267; EN ISO 2719; JIS K2265; NF M07-019; DIN 51 758; FTM 791 1102; EPA 1010A; GB/T 261

ABEL (Closed Cup and Equilibrium)

IP 170; IP 304 (obs) Part 2; IP 492; BS 2000 Part 170; BS 3900 Parts A8 and A9; BS 6664 Parts 1 and 2; EN ISO 13736; ISO 1523

CLEVELAND (Open Cup)

ASTM D92; IP 36; EN ISO 2592; BS 2000 Parts 36 & 403 (obs); DIN 51 376; NF T60-119; JIS K2265; AASHTO T48

TAG (Closed Cup)

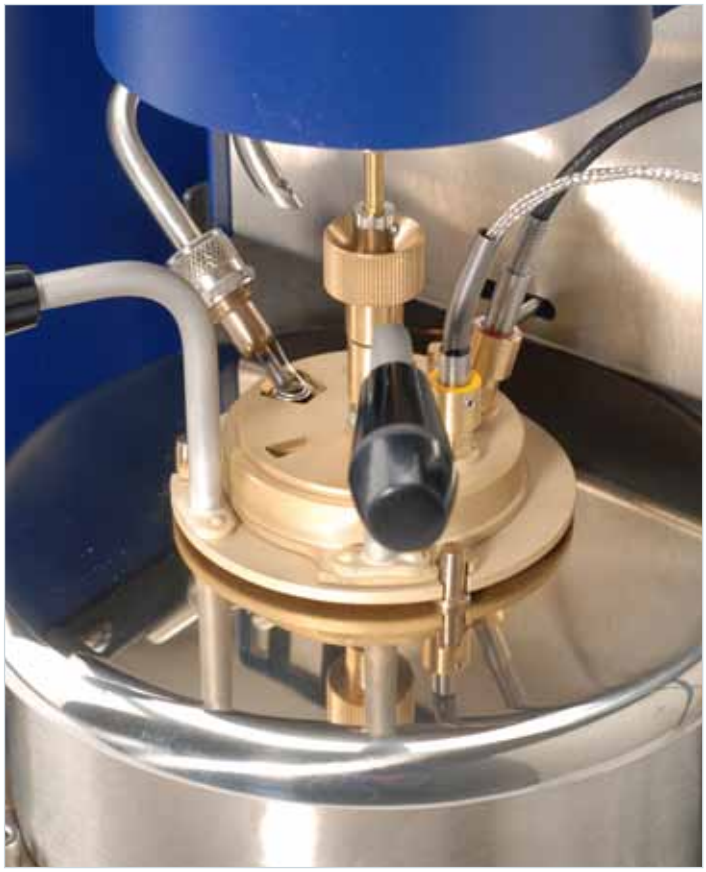
ASTM D56; D3934; D3941; E502; IP 304 (obs) Parts 1 & 2; IP 491: IP 492; ISO 1516; ISO 1523; FTM 791 1101; JIS K2265

SMALL SCALE Rapid Equilibrium (Setaflash) Closed Cup

ASTM D3278; D3828; D7236; E502; IP 303 (obs); IP 523; IP 524; IP 534; ISO 3679; ISO 3680; BS EN 456; BS 6664 Parts 3 & 4; BS 3900 Part A13; UN Class 3 Non-viscous Flammable Liquids; CHIPS Regulations; Classification of Dangerous Goods for Carriage: Viscous and Non-viscous Liquids; EPA 1020 A & B

MODULAR FLASH POINT TESTER

- **ALL MAJOR TEST METHODS**
  - Pensky-Martens (A,B & C Closed Cup and Chinese Method: GB)
  - Abel (Closed Cup & Equilibrium)
  - TAG (Closed Cup & Equilibrium)
  - Cleveland (Open Cup)
  - Small Scale Rapid Equilibrium (Setaflash)
- **UNIVERSAL OPERATION**
  - Unique '5 in 1' modular solution for flash point testing
  - All primary flash point tests from one instrument
  - Universal base, interchangeable test modules
  - Gas or electric ignition
- **FULLY AUTOMATIC**
  - Automatic set up of test parameters
  - Automatic heating control, ignition & flash detection
  - Automatic test results & end of test warning
  - Automatic barometric correction
- **UNRIVALLED EASE OF USE**
  - Minimum operator input
  - Integral self diagnosis
- **LOW COST**
  - Modular design optimises capital outlay
  - Instrument can be configured to match the requirements of the user
  - Simple to extend range of test methods by adding modules
- **STRICT CONFORMITY TO TEST METHODS**
  - Precise results
  - Procedures in conformance with method of test
  - Critical components designed in exact conformance with test methods
  - Easy and quick calibration and verification procedures
- **FAST & RELIABLE PERFORMANCE**
  - Designed for long service life
  - Reliable and proven technology
  - Simple operation
  - Error messaging
  - Calibration & diagnostics mode
- **IN-BUILT SAFETY**
  - 3 independant hardware safety systems
  - Fire sensors, over-temperature protection and automatic gas shut off
  - Automatic sample, bath fluid and probe checks prior to heating
  - Integral software limits
  - Suitable for unattended operation
  - Pensky-Martens D93 10°C safety protocol
- **RANGE OF ACCESSORIES**
  - Clear draught screens
  - Printer
  - Remote alarm system
  - Rapid cooling modules & cryostats
  - Calibration and verification instruments and materials



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MODULAR FLASH POINT TESTER

34100-2 MULTIFLASH – PENSKY-MARTENS CLOSED CUP MODULE

ASTM D93; E502; IP 34; IP 404 (obs); BS 2000 Parts 34 & 404 (obs); ISO 15267; EN ISO 2719; JIS K2265; NF M07-019; DIN 51 758; FTM 791 1102; EPA 1010A; GB/T 261

- Procedures A, B and C
- Flexible automated search mode
- Ambient to 400°C temperature range
- Gas or electric ignition
- Independent fire detector

The Pensky-Martens Closed Cup Module comprises a Test Area, DIPS pod (Dipping, Ignition, Pilot, Stirrer), flash detector, sample temperature probe, and all necessary cables to interconnect with the 34000-0 Universal Base Unit.

The Test Area consists of an electrically heated solid block/air bath with a removeable sample cup and lid. The lid is equipped with a stirrer, rotating shutter, and ports for the flash detector and sample temperature probe.

The DIPS pod contains a fire detection probe, stirrer drive, shutter actuator and ignitor dipping mechanism with a coaxial gas jet/electric hot wire ignitor.

The sample temperature probe is a class A PRT, and flash detection is by a thermocouple.

Safety features include an initial dip to check that the sample is below its flash point, a PRT check to ensure that the correct probe is connected and is immersed in the sample, and new 10°C dipping protocol. When in search mode, the software limits the maximum temperature to 50°C above "expected flash". A bath temperature probe protects against over-temperature, and an independent fire detection probe is mounted over the teat area.

The optional 34008-0 Cooling Boost Module allows the test area to be rapidly cooled in between tests by a blast of compressed air.

SUPPLIED WITH: DIPS pod, Test Area, Ignitor, Flash Detector, Sample PRT, interconnection leads, and instruction manual.

Note: 34000-0 Universal Base Unit required for operation.

34100-2 mounted on a 34000-0 Base Unit with a 34010-0 Draught Screen fitted

BIO-FUEL TESTING

CALIBRATION & VERIFICATION MATERIALS

SETALERT COMPATIBLE

TECHNICAL DATASHEETS AVAILABLE

SPECIFICATIONS

Method:	Pensky-Martens Closed Cup
Tests:	P-M Procedures A, B & C GB/T 261 Search mode for unknown samples
Temperature Range:	Ambient to 400°C
Barometric Correction:	Automatic
Bath:	Solid Block/Air
Heating:	Bottom and side heaters
Post Test Cooling:	Fan assisted or Forced Air (Requires 34008-0 Cooling Boost Module option)
Post Test Cool-down Time (90°C to 50°C):	36 minutes (Fan) 6 minutes (Forced Air)
Ignitor:	Quick-fit coaxial gas jet/electric hot wire, user selectable (Electric hot wire pilot light for gas jet)
Temperature Probes:	Class A Platinum Resistance Thermometer, °C or °F
Flash Detection:	Thermocouple
Stirrer Speed:	105 & 250 rpm
Gas Supply (gas jet ignitor):	Laboratory gas, 3kPa (0.44psi) maximum pressure
Air Supply (forced air cooling):	Dry compressed air, 670kPa (100psi) maximum pressure
Voltage:	110/120V or 220/240V, 50/60Hz, (switchable)
Power:	1kW
Size (HxWxD):	40 x 45 x 34cm
Weight:	20kg

ACCESSORIES – Pensky-Martens Closed Cup Module

OPTIONAL

00100-0	SETALERT REMOTE PAGING SYSTEM
23680-0	SPIRIT LEVEL
34003-0	RS232 CABLE, for connecting instrument to PC.
34008-0	COOLING BOOST MODULE
34010-0	DRAUGHT SCREEN (recommended for gas tests).
81002-2	PRINTER

CALIBRATION VERIFICATION & TRAINING

60005-002	DRY WELL PROBE CALIBRATOR, *(for details see page 144).*
99851-0	MULTI-TEST VERIFICATION MATERIAL, D93 - IP 34 Gas Oil, *(for details see page 150).*
99853-0	MULTI-TEST VERIFICATION MATERIAL, D93 - IP 34 Lubricating Oil, *(for details see page 151).*
99908-0	BIO MULTI-TEST VERIFICATION MATERIAL, Gas Oil, *(for details see page 151).*
99880-0	FLASHCHECK, secondary verification material, *(for details see page 156).*
99910-0	PORTABLE DIGITAL BAROMETER, 750 to 1500 mbar absolute, *(for details see page 145).*
99960-0	DIGITAL PHOTO TACHOMETER, *(for details see page 147).*

CONSUMABLES – Pensky-Martens Closed Cup Module

2 Years/2000 Tests		Qty
34100-001	FLASH DETECTOR	2
34100-002	SAMPLE PRT PROBE	1
34100-004	CO-AXIAL IGNITOR	2
81002-001	PRINTER PAPER, pack of 20 rolls	1

34200-0 MULTIFLASH – ABEL CLOSED CUP MODULE

IP 170; IP 304 (obs) Part 2; IP 492; BS 2000 Part 170; BS 3900 Parts A8 and A9; BS 6664 Parts 1 & 2; EN ISO 13736; ISO 1523

- Equilibrium tests
- Non-Equilibrium tests
- Flash/No-Flash tests
- Flexible automated search mode
- Ambient to 93°C (5°C to 93°C with optional cryostat)
- Gas or electric ignition

The Abel Closed Cup Module comprises a Test Area, DIPS pod (Dipping, Ignition, Pilot, Stirrer), flash detector, sample temperature probe, outer and inner bath temperature probes and all necessary cables to interconnect with the 34000-0 Universal Base Unit.

The Test Area consists of an outer liquid filled bath surrounding an inner liquid filled bath and a removeable sample cup and lid. The outer bath is heated by the hotplate within the 34000-0 Universal Base Unit, has a port for a temperature probe and connections for a 34008-0 Cooling Boost Module, allowing circulation of cooling fluid via a cryostat for sub-ambient tests. The inner bath also has provision for a temperature probe. The lid of the sample cup is equipped with a stirrer, sliding shutter, and ports for the flash detector and sample temperature probe.

The DIPS pod contains a stirrer drive, shutter actuator and ignitor dipping mechanism with a coaxial gas jet/electric hot wire ignitor.

The outer bath, inner bath and sample temperature probes are class A PRTs, and flash detection is by a thermocouple.

Safety features include an initial dip to check that the sample is below its flash point at the start of the test and PRT checks to ensure that the correct probes are connected and are immersed in bath liquids or sample. When in search mode, the software limits the maximum temperature to 50°C above "expected flash". An over-temperature cut-out is mounted on the base flange of the outer bath.

SUPPLIED WITH: DIPS pod, Test Area, Ignitor, Flash Detector, Inner and Outer Bath PRTs, Sample PRT, interconnection leads, instruction manual.

Note: 34000-0 Universal Base Unit and 34008-0 Cooling Boost Module are required for operation. Sub-ambient tests down to 5°C require a 34006-0 Cryostat.

34200-0 mounted on a 34000-0 Base Unit with a 34012-0 Draught Screen fitted

CALIBRATION & VERIFICATION MATERIALS

SETALERT COMPATIBLE

TECHNICAL DATASHEETS AVAILABLE

SPECIFICATIONS

Method:	Abel Closed Cup
Tests:	Equilibrium Non-Equilibrium Flash/No Flash
Temperature Range:	Ambient to 93°C (5°C to 93°C with optional cryostat)
Barometric Correction:	Automatic
Bath:	Liquid/Liquid
Heating:	Hot Plate
Post Test Cooling:	Fan assisted or Circulating liquid/external cryostat (optional)
Post Test Cool-down Time (90°C to 50°C):	45 minutes (Fan) 3 minutes (external cryostat)
Ignitor:	Quick-fit coaxial gas jet/electric hot wire, user selectable (Electric hot wire pilot light for gas jet)
Temperature Probes:	Class A Platinum Resistance Thermometers
Flash Detection:	Thermocouple
Stirrer Speed:	30 rpm
Gas Supply (gas jet ignitor):	Laboratory gas, 3kPa (0.44psi) maximum pressure
Cooling Supply:	Water (5°C and above) Water/Ethylene Glycol 50/50 (below 5°C) 125kPa (18psi) maximum pressure
Voltage:	110/120V or 220/240V, 50/60Hz, (switchable)
Power:	600W
Size (HxWxD):	47 x 45 x 34cm
Weight:	13kg

ACCESSORIES – Abel Closed Cup Module

REQUIRED	
34008-0	COOLING BOOST MODULE
OPTIONAL	
00100-0	SETALERT REMOTE PAGING SYSTEM
23680-0	SPIRIT LEVEL
34003-0	RS232 CABLE, for connecting instrument to PC.
34006-0	CRYOSTAT (-20°C).
34007-0	SHUTTER LUBE
34012-0	DRAUGHT SCREEN (recommended for gas tests).
81002-2	PRINTER
CALIBRATION VERIFICATION & TRAINING	
60005-002	DRY WELL PROBE CALIBRATOR, *(for details see page 144).*
99850-0	MULTI-TEST VERIFICATION MATERIAL, IP 170 Kerosine, *(for details see page 150).*
99910-0	PORTABLE DIGITAL BAROMETER, 750 to 1500 mbar absolute, *(for details see page 145).*
99960-0	DIGITAL PHOTO TACHOMETER, *(for details see page 147.*

CONSUMABLES – Abel Closed Cup Module

2 Years/2000 Tests		Qty
34100-002	SAMPLE PRT PROBE	1
34200-003	OUTER BATH PRT PROBE	1
34200-005	CO-AXIAL IGNITOR	2
34700-001	FLASH DETECTOR	2
81002-001	PRINTER PAPER, pack of 20 rolls	1

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MODULAR FLASH POINT TESTER

34300-0 MULTIFLASH – CLEVELAND OPEN CUP MODULE

ASTM D92; IP 36; EN ISO 2592; BS 2000 Parts 36 & 403 (obs); DIN 51 376; NF T60-119; JIS K2265; AASHTO T48

- Flash Point & Fire Point
- Flexible automated search mode
- Ambient to 400°C temperature range
- Gas or electric ignition
- Automatic snuffer
- Independent fire detector

The Cleveland Open Cup Module comprises a Test Area, DIPS pod (Dipping, Ignition, Pilot, Stirrer), flash/fire detector, sample temperature probe, and all necessary cables to interconnect with the 34000-0 Universal Base Unit.

The Test Area consists of a removeable sample cup in a thermal insulation ring, and a probe block for mounting the flash/fire detector and sample temperature probe. The sample cup is heated by the hotplate within the 34000-0 Universal Base Unit.

The DIPS pod contains the ignitor sweeping mechanism with a coaxial gas jet/electric hot wire ignitor, and a snuffer that extinguishes any flames in the sample cup at the end of the test.

The sample temperature probe is a class A PRT, and flash/fire detection is by an ionisation ring.

Safety features include an initial sweep to check that the sample is below its flash point at the start of the test and a PRT check to ensure that the correct probe is connected and is immersed in sample. When in search mode, the software limits the maximum temperature to 50°C above "expected flash". The snuffer automatically deploys at the end of the test or if the independant fire detection probe (mounted over the test area) detects a flame. The hotplate in the 34000-0 is equipped with a cut-out to protect against over-temperature.

The optional 34008-0 Cooling Boost Module allows the test area to be rapidly cooled in between tests by a blast of compressed air.

SUPPLIED WITH: DIPS pod, Test Area, Ignitor, Flash/Fire Detector, Sample PRT, interconnection leads, and instruction manual.

Note: 34000-0 Universal Base Unit required for operation.

34300-0 mounted on a 34000-0 Base Unit with a 34012-0 Draught Screen fitted

CALIBRATION & VERIFICATION MATERIALS

SETALERT COMPATIBLE

TECHNICAL DATASHEETS AVAILABLE

SPECIFICATIONS

Method:	Cleveland Open Cup
Tests:	Flash Point and Fire Point Non-Equilibrium Search mode for unknown samples
Temperature Range:	Ambient to 400°C
Barometric Correction:	Automatic
Bath:	N/A
Heating:	Hotplate
Post Test Cooling:	Fan assisted or Forced Air (Requires 34008-0 Cooling Boost Module option)
Post Test Cool-down Time (90°C to 50°C):	9 minutes (Fan) 6 minutes (Forced Air)
Ignitor:	Quick-fit coaxial gas jet/electric hot wire, user selectable (Electric hot wire pilot light for gas jet)
Temperature Probe:	Class A Platinum Resistance Thermometer, °C or °F
Flash/Fire Detection:	Ionisation Ring
Gas Supply (gas jet ignitor):	Laboratory gas, 3kPa (0.44psi) maximum pressure
Air Supply (forced air cooling):	Dry compressed air, 670kPa (100psi) maximum pressure
Voltage:	110/120V or 220/240V, 50/60Hz, (switchable)
Power:	1kW
Size (HxWxD):	34 x 45 x 42cm
Weight:	20kg

ACCESSORIES – Cleveland Open Cup Module

OPTIONAL

00100-0	SETALERT REMOTE PAGING SYSTEM
23680-0	SPIRIT LEVEL
34003-0	RS232 CABLE, for connecting instrument to PC.
34008-0	COOLING BOOST MODULE
34012-0	DRAUGHT SCREEN (recommended for gas tests).
34301-0	HUSSAMI KIT
81002-2	PRINTER

CALIBRATION VERIFICATION & TRAINING

60005-002	DRY WELL PROBE CALIBRATOR, *(for details see page 144).*
99880-0	FLASHCHECK, secondary verification material, *(for details see page 156).*
99910-0	PORTABLE DIGITAL BAROMETER, 750 to 1500 mbar absolute, *(for details see page 145).*

CONSUMABLES – Cleveland Open Cup Module

2 Years/2000 Tests		Qty
34100-004	CO-AXIAL IGNITOR	2
34300-001	IONISATION RING	2
34300-002	SAMPLE PRT PROBE	1
81002-001	PRINTER PAPER, pack of 20 rolls	1

34400-0 TAG CLOSED CUP MODULE

ASTM D56; D3934; D3941; E502; IP 304 (obs) Part 2; IP 491: IP 492; ISO 1516; ISO 1523; FTM 791 1101; JIS K2265

- Equilibrium tests
- Non-Equilibrium tests
- Flash/No-Flash tests
- Flexible automated search mode
- Ambient to 93°C (5°C to 93°C with optional cryostat)
- Gas or electric ignition

The TAG Closed Cup Module comprises a Test Area, DIPS pod (Dipping, Ignition, Pilot, Stirrer), flash detector, sample temperature probe, bath temperature probe and all necessary cables and pipes to interconnect with the 34000-0 Universal Base Unit and 34008 Cooling Boost Module.

The Test Area consists of a liquid filled bath with an internal cooling coil, a removeable sample cup and lid, and an overflow vessel. The bath is heated by the hotplate within the 34000-0 Universal Base Unit. The cooling coil is connected to the 34008-0 Cooling Boost Module by flexible pipes allowing circulation of water or cooling fluid via a cryostat for sub-ambient tests. The top of the bath has a port for a temperature probe. The lid of the sample cup is equipped with a sliding shutter, and ports for the flash detector and sample temperature probe.

The DIPS pod contains the shutter actuator and ignitor dipping mechanism with a coaxial gas jet/electric hot wire ignitor.

The sample and bath temperature probes are class A PRTs, and flash detection is by a thermocouple.

Safety features include an initial dip to check that the sample is below its flash point at the start of the test and PRT checks to ensure that the correct probes are connected and are immersed in bath liquid or sample. When in search mode, the software limits the maximum temperature to 50°C above "expected flash". An over-temperature cut-out is mounted on the base flange of the bath.

SUPPLIED WITH: DIPS pod, Test Area, Ignitor, Flash Detector, Bath PRT, Sample PRT, interconnection leads and instruction manual.

Note: Requires 34000-0 Universal Base Unit and 34008-0 Cooling Boost Module. For sub-ambient tests down to 5°C a Cryostat (34006-0) is also required.

34400-0 mounted on 34000-0 with 34011-0 Draught Screen

CALIBRATION & VERIFICATION MATERIALS

SETALERT COMPATIBLE

TECHNICAL DATASHEETS AVAILABLE

SPECIFICATIONS

Method:	TAG Closed Cup
Tests:	Non-Equilibrium Equilibrium Flash/No Flash
Temperature Range:	Ambient to 93°C (5°C to 93°C with optional cryostat)
Barometric Correction:	Automatic
Bath:	Liquid
Heating:	Hot Plate
Post Test Cooling:	Fan assisted or Circulating liquid/external cryostat (Requires 34008-0 Cooling Boost Module option)
Post Test Cool-down Time (90°C to 50°C):	40 minutes (Fan) 3 minutes (external cryostat)
Ignitor:	Quick-fit coaxial gas jet/electric hot wire, user selectable (Electric hot wire pilot light for gas jet)
Temperature Probes:	Class A Platinum Resistance Thermometers
Flash Detection:	Thermocouple
Gas Supply (gas jet ignitor):	Laboratory gas, 3kPa (0.44psi) maximum pressure
Cooling Supply:	Water (5°C and above) Water/Ethylene Glycol 50/50 (below 5°C) 125kPa (18psi) maximum pressure
Voltage:	110/120V or 220/240V, 50/60Hz, (switchable)
Power:	1kW
Size (HxWxD):	42 x 45 x 34cm
Weight:	20kg

ACCESSORIES - TAG Closed Cup Module

REQUIRED

34008-0	COOLING BOOST MODULE

OPTIONAL

00100-0	SETALERT REMOTE PAGING SYSTEM
23680-0	SPIRIT LEVEL
34003-0	RS232 CABLE, for connecting instrument to PC.
34006-0	CRYOSTAT (-20°C).
34007-0	SHUTTER LUBE
34011-0	DRAUGHT SCREEN (recommended for gas tests).
81002-2	PRINTER

CALIBRATION VERIFICATION & TRAINING

60005-002	DRY WELL PROBE CALIBRATOR, *(for details see page 147).*
99880-0	FLASHCHECK, secondary verification material, *(for details see page 156).*
99910-0	PORTABLE DIGITAL BAROMETER, 750 to 1500 mbar absolute, *(for details see page 145).*

CONSUMABLES - TAG Closed Cup Module

2 Years/2000 Tests		Qty
34100-001	FLASH DETECTOR	2
34400-002	SAMPLE PRT PROBE	1
34400-003	BATH PRT PROBE	1
34400-005	CO-AXIAL IGNITOR	2
81002-001	PRINTER PAPER, pack of 20 rolls	1

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MODULAR FLASH POINT TESTER

34700-0 SMALL SCALE (SETAFLASH) CLOSED CUP MODULE

ASTM D3278; D3828; D7236; E502; IP 303 (obs) Parts 1 & 2; IP 523; IP 524; IP 534; ISO 3679; ISO 3680; BS 6664 Parts 3 & 4; BS 3900 Part A13; BS EN 456; EPA 1020 A & B; UN Class 3 Non-viscous Flammable Liquids; CHIPS Regulations; Classification of Dangerous Goods for Carriage: Viscous and Non-viscous Liquids

- Rapid Equilibrium Tests
- Non-Equilibrium tests
- Flash/No-Flash tests
- Flexible automated search (ramp) mode
- Ambient to 300°C (-10°C to 300°C with optional cryostat)
- Gas or electric ignition

The Small Scale (Setaflash) Closed Cup Module comprises a Test Area, DIPS pod (Dipping, Ignition, Pilot, Stirrer), flash detector, and all necessary cables to interconnect with the 34000-0 Universal Base Unit.

The Test Area consists of an electrically heated solid block bath/sample cup with an integral temperature probe. The bath has a network of internal passages and can be connected to a 34008-0 Cooling Boost Module, allowing circulation of cooling fluid via a cryostat for sub-ambient tests. The hinged lid is equipped with a shutter and ports for the flash detector and injecting sample.

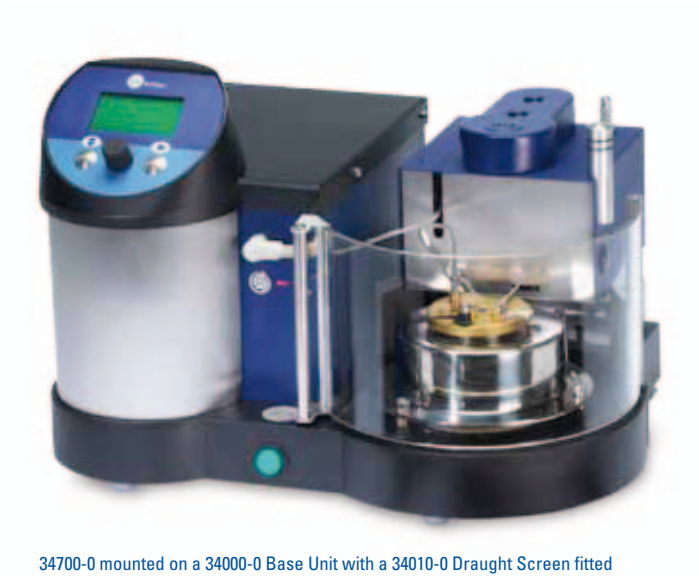
The DIPS pod contains the shutter actuator and ignitor dipping mechanism with a coaxial gas jet/electric hot wire ignitor.

The temperature probe is a class A PRT and flash detection is by a precision thermocouple.

Safety features include a check to ensure that the sample probe and flash detector are connected. When in search mode, the software limits the maximum temperature to 50°C above "expected flash".

SUPPLIED WITH: DIPS pod, Test Area, Ignitor, Flash Detector, Sample PRT, interconnection leads, and instruction manual.

Note: 34000-0 Universal Base Unit required for operation. For sub-ambient tests a Cooling Boost Module (34008-0) and Cryostat (34006-0) are also required.



34700-0 mounted on a 34000-0 Base Unit with a 34010-0 Draught Screen fitted

BIO-FUEL TESTING

CALIBRATION & VERIFICATION MATERIALS

SETALERT COMPATIBLE

TECHNICAL DATASHEETS AVAILABLE

SPECIFICATIONS

Method:	Small Scale Closed Cup
Tests:	Rapid Equilibrium Non-Equilibrium Flash/No Flash Search mode for unknown samples
Temperature Range:	Ambient to 300°C (-10°C to 300°C with optional cryostat)
Barometric Correction:	Automatic
Bath:	Solid Block
Heating:	Side heaters
Post Test Cooling:	Fan assisted Forced air or circulating liquid option (Requires 34008-0 Cooling Boost Module and 34006-0 Cryostat)
Post Test Cool-down Time (90°C to 50°C):	36 minutes (Fan) 2 minutes (Cryostat)
Ignitor:	Quick-fit coaxial gas jet/electric hot wire, user selectable (Electric hot wire pilot light for gas jet)
Temperature Probe:	Class A Platinum Resistance Thermometer, °C or °F
Flash Detection:	Thermocouple
Gas Supply (gas jet ignitor):	Laboratory gas, 3kPa (0.44psi) maximum pressure
Cooling Supply (Air): **(Liquid):**	Dry compressed air, 670kPa (100psi) maximum pressure Water (5°C and above) Water/Ethylene Glycol 50/50 (below 5°C) 125kPa (18psi) maximum pressure
Voltage:	110/120V or 220/240V, 50/60Hz, (switchable)
Power:	1kW
Size (HxWxD):	34 x 47 x 42cm
Weight:	20kg

ACCESSORIES - Small Scale Closed Cup Module

OPTIONAL

00100-0	SETALERT REMOTE PAGING SYSTEM
13770-311	SYRINGE, 4ml, for tests above 100°C.
23680-0	SPIRIT LEVEL
34003-0	RS232 CABLE, for connecting instrument to PC.
34006-0	CRYOSTAT (-20°C). For tests to -10°C.
34008-0	COOLING BOOST MODULE
34010-0	DRAUGHT SCREEN (recommended for gas tests).
81002-2	PRINTER

CALIBRATION VERIFICATION & TRAINING

99878-3	SMALL SCALE CERTIFIED FLASH POINT MATERIAL, *(for details see page 156).*
99910-0	PORTABLE DIGITAL BAROMETER, 750 to 1500 mbar absolute, *(for details see page 145).*
99928-0	SETATHERM, *(for details see page 129).*

CONSUMABLES - Small Scale Closed Cup Module

2 Years/2000 Tests		Qty
13740-004	SAMPLE WELL O RING, viton, pack of 5.	1
13770-004	SAMPLE WELL O RING, silicone, pack of 5.	1
34200-005	CO-AXIAL IGNITOR	2
34700-001	FLASH DETECTOR	2
81002-001	PRINTER PAPER, pack of 20 rolls	1

SMALL SCALE FLASH POINT

Small scale flash point testers are universally specified in many international regulations to define and classify 'flammable' and 'combustible' substances. They provide the most precise and fastest means of carrying out flash point tests on a definitive 'flash/no flash' basis, both in the laboratory and the field. A 2ml sample size and 1 minute test time for low temperature tests make these instruments ideally suited for many applications. Petrochemicals, Biodiesel (FAME), adhesives, foods, flavours, cosmetics, paints/varnishes, waste, pharmaceuticals, polishes and aerosols are just some of the products routinely tested.

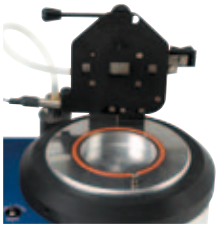
Fully meeting the requirements of Rapid Equilibrium methods ISO 3679/3680, Setaflash Testers are the only small scale instruments with flash detection. Setaflash is specified by ASTM D1655 and the UK DEFSTAN 91-91 for testing Aviation Turbine Fuels, Diesel (D975), Fuel Oil (D396), Gas Turbine Fuel (D2880) and Kerosine (D3699), and is the only instrument recommended for testing waterborne paints. In Europe it is specified in the specifications for FAME Heating and Automotive Fuels - EN 14214 and EN 14213.

Setaflash Series 3 Range

Portable

Simple to Use

Electrical Ignitor



Small Sample Size

Easy to Use Menu System

Setaflash Series 8

Large Colour Display

1

SETAFLASH SMALL SCALE FLASH POINT

82100-0 SETAFLASH SERIES 8 'ACTIVECOOL' CLOSED CUP TESTER

ASTM D3278; D3828; D7236; E502; IP 523; IP 524; IP 534; ISO 3679; ISO 3680; BS 3900 Part 13; BS 6664 Parts 3 & 4; UN Class 3 Non-viscous Flammable Liquids; CHIPS Regulations; EPA 1020 A & B

- -20 to 130°C (-4 to 266°F) temperature range
- Small sample size, 2 or 4ml
- Flash/No Flash & Ramp modes
- Electric ignitor (with gas option)
- Automatic dipping and flash detection
- ActiveCool electronic Peltier cooling
- 64 Test memory & RS232 interface
- °C or °F temperature display

The Series 8 'ActiveCool' is an automated closed cup flash point tester with a temperature range of 10 to 130°C (50 to 266°F) with no external cooling required. When connected to a suitable water supply, the range is extended down to -20°C (-4°F).

There are two modes of operation; Flash/No Flash and Ramp. The ramp mode increases the sample temperature at a rate of 2°C/min and automatically dips the ignitor every 1°C up to 100°C (every 2°C above 100°C), until either a flash is detected or the end of test temperature is reached.

The automatic flash detection system is tuned to ignore halo and other false flash effects, enhancing precision and accuracy. Barometric pressure is measured by an internal barometer, and the correction is automatically applied to the test result.

Peltier cell technology is used for heating and cooling, ensuring precise temperature control and rapid cooldown after a test is completed. The ignitor uses a new electrical hot wire (a gas flame option is available).

The bright colour LCD display shows test parameters and the test result. The text and colour of the top line indicates instrument status. All functions are accessed via menus, navigated by the keypad. Up to 64 test results can be stored in memory, each tagged with a sample reference and operator name. Results can be downloaded to a PC or printer via the RS232C port (USB or LAN ports options available). The firmware is upgradeable for future developments.

SUPPLIED WITH: Ignitor, 2ml syringe, mains lead and instruction manual.

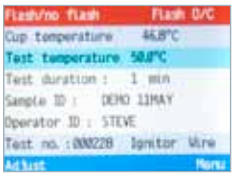
82100-0

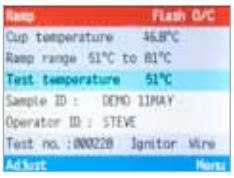
BIO-FUEL TESTING

CALIBRATION & VERIFICATION MATERIALS

SETAPLUS EXTENDED WARRANTY AVAILABLE

TECHNICAL DATASHEETS AVAILABLE





82150-0 SETAFLASH SERIES 8 'ACTIVECOOL' (CORROSION RESISTING)

- Corrosion resisting stainless steel cup insert variant of 82100-0

Similar to the 82100-0 with a corrosion resisting insert in the sample cup.

SUPPLIED WITH: Ignitor, 2ml syringe, mains lead and instruction manual.

ACCESSORIES – Setaflash Series 8				
OPTIONAL		82100-0	82150-0	82000-0
13747-0	SETA SOLID SAMPLE DISPENSER *(for details see page 15).*	●	●	●
13770-311	SYRINGE, 4ml, for tests above 100°C.	●	●	●
26000-0	LIQUID RECOVERY SYSTEM, with pump and trap to remove hot sample from cup, *(for details see page 15).*	●	●	●
71001-0	SETA VENT, *(for details see page 19).*	●	●	●
99300-2	LOW TEMPERATURE CIRCULATOR, for low temperature tests in high ambient temperatures *(see page 139).*	●	●	
45001-0	SETAPLUS EXTENDED 12 MONTH WARRANTY	●	●	●
CALIBRATION, VERIFICATION & TRAINING				
99878-3	SMALL SCALE CERTIFIED FLASH POINT MATERIAL, *(for details see page 15).*	●	●	●
99928-0	SETATHERM, digital thermometer, -20 to 150°C, *(for details see page 129).*	●	●	●

Note: For gas options please contact Seta

82000-0 SETAFLASH SERIES 8 CLOSED CUP TESTER

ASTM D3278; D3828; D7236; E502; IP 523; IP 524; IP 534; ISO 3679; ISO 3680; BS 3900 Part 13; BS 6664 Parts 3 & 4; UN Class 3 Non-viscous Flammable Liquids; CHIPS Regulations; EPA 1020 A & B

- Ambient +5 to 300°C (ambient +9 to 572°F) temperature range
- Small sample size, 2 or 4ml
- Flash/No Flash & Ramp modes
- Electric ignitor (with gas option)
- Automatic dipping and flash detection
- 64 Test Memory & RS232 Interface
- °C or °F Temperature Display
- Integral Barometer & Auto Correction

The Series 8 is an automated closed cup flash point tester with a temperature range of ambient +5 to 300°C (ambient +9 to 572°F). The instrument uses an electric hot wire ignitor (gas flame option).

There are two modes of operation; Flash/No Flash and Ramp. The ramp mode increases the sample temperature at a rate of 2°C/min, allowing determination of a flash point in accordance with ASTM D7236 and IP 534. The dipping sequence occurs automatically every 1°C up to 100°C (every 2°C rise above 100°C), until either a flash is detected or the end of test temperature is reached. The ignitor uses a new electrical hotwire (a gas flame option is available).

The bright colour LCD display shows test parameters and the test result. The text and colour of top line of the display indicates the instrument status. All functions are accessed via menus, navigated by the keypad. Audible prompts are given when an action is required from the operator.

The automatic flash detection system is tuned to ignore halo and other false flash effects, reducing the chance of mis-interpretation of the test result, and enhancing repeatability. Barometric pressure is measured by an internal barometer, and the correction is automatically applied to the test result. At the end of a test, the sample cup is cooled by forced air to reduce the cycle time between tests.

Up to 64 results can be stored in memory, tagged with operator and sample references, and can be downloaded to a PC or printer via the RS232C port (USB or LAN ports available as options). The firmware is upgradeable for future developments.

SUPPLIED WITH: Ignitor, 2ml syringe, mains lead and instruction manual.

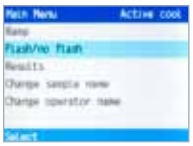
82000-0

BIO-FUEL TESTING

CALIBRATION & VERIFICATION MATERIALS

SETAPLUS EXTENDED WARRANTY AVAILABLE

TECHNICAL DATASHEETS AVAILABLE



SPECIFICATIONS

Seta Part No:	82100-0	82150-0	82000-0
Temperature Range:	Air: 10 to 130°C (50 to 266°F) Water Assisted: -20 to 130°C (-4 to 266°F)	Air: 10 to 130°C (50 to 266°F) Water Assisted: -20 to 130°C (-4 to 266°F)	Ambient +5 to 300°C (Ambient +9 to 572°F)
Sample Size:	2 or 4ml according to method	2 or 4ml according to method	2 or 4ml according to method
Ignitor:	Electrical Hot Wire (optional Gas Flame)	Electrical Hot Wire (optional Gas Flame)	Electrical Hot Wire (optional Gas Flame)
Test Modes:	Rapid Equilibrium and Ramp	Rapid Equilibrium and Ramp	Rapid Equilibrium and Ramp
Test Duration Rapid Equilibrium Mode:	1 minute below 100°C, 2 minutes above 100°C, FAME 1 minute or user defined 1 to 99 minutes	1 minute below 100°C, 2 minutes above 100°C, FAME 1 minute or user defined 1 to 99 minutes	1 minute below 100°C, 2 minutes above 100°C, FAME 1 minute or user defined 1 to 99 minutes
Test Duration Ramp Mode:	Typically 7 minutes	Typically 7 minutes	Typically 7 minutes
Cool Down Time:	80 to 20°C (176 to 68°F) in 4 minutes	80 to 20°C (176 to 68°F) in 4 minutes	N/A
Sample Cup Material:	Aluminium	Corrosion resisting steel insert, aluminium cup	Aluminium
Heating/Cooling Method	Peltier Cell	Peltier Cell	Ceramic Pad, Forced Air (post-test cooldown)
Computer Interface:	RS232C (USB & LAN options)	RS232C (USB & LAN options)	RS232C (USB & LAN options)
Power:	300W (maximum)	300W (maximum)	300W (maximum)
Voltage:	100 to 250V, 50/60Hz (2x AA dry cell batteries required for internal clock)	100 to 250V, 50/60Hz (2x AA dry cell batteries required for internal clock)	100 to 250V, 50/60Hz (2x AA dry cell batteries required for internal clock)
Size (HxWxD):	30 x 34 x 38cm	30 x 34 x 38cm	30 x 34 x 38cm
Weight:	8kg	8kg	8kg

1

SETAFLASH SMALL SCALE FLASH POINT

33200-2 SETAFLASH SERIES 3 ACTIVE COOL

ASTM D3278; D3828 ; D7236; E502; IP 303 (obs); IP 523; IP 524; IP 534; ISO DIN 3679; ISO 3680; BS EN 456; BS 3900 Part A13; BS 6664 Part 3 & 4; UN Class 3 Non-viscous Flammable Liquids; CHIPS Regulations; EPA 1020 A & B; Classification of Dangerous Goods for Carriage: Viscous and Non Viscous Liquids;

- Flash/No Flash & Ramp modes
- 10 to 130°C temperature range
- Flash point test in less than 2 minutes
- Small sample size (2 or 4ml)
- Automatic flash detection
- Electronic peltier cooling
- Audible and on-screen prompts
- Portable operation
- °C or °F display

Active Cool is the latest instrument in the Setaflash Series 3 range. It has been designed to rapidly and efficiently carry out Flash/No Flash tests and to determine the flash point of liquids and semi-solids in the 10 to 130°C (50 to 266°F) temperature range.

When used in Ramp mode the temperature of the sample increases at a rate of 2°C/min. An audible prompt to carry out a flash test occurs every 1°C rise up to 100°C (every 2°C rise above 100°C), until a flash is detected, allowing rapid determination of a flash point in accordance with ASTM D7236 and IP 534.

The sample cup is heated/cooled by peltier cells. This gives very accurate and stable sub-ambient test temperatures and the benefit of rapid temperature normalisation between tests.

All functions are accessed via a two button keypad and the Seta Multifunctional And Rotational Test (SMART) control feature. The digital display shows test parameters, instrument status, and the test result. An audible prompt is sounded when an action is required from the operator.

Gas for the test jet/shutter assembly is supplied from an integral gas tank, which is filled using a standard butane (lighter) refill cartridge.

The automatic flash detection system is tuned to ignore halo and other false flash effects, reducing the chance of mis-interpretation of the test result, and enhancing repeatability. Barometric pressure is measured by an internal barometer, and the correction is automatically applied to the test result.

The instrument is lightweight and suitable for mobile use when operated from the optional DC power adaptor.

SUPPLIED WITH: 2ml syringe, mains lead and instruction manual.

FOR SPECIFICATIONS, ACCESSORIES & CONSUMABLES, SEE PAGE 14.

33200-2

BIO-FUEL TESTING

CALIBRATION & VERIFICATION MATERIALS

SETAPLUS EXTENDED WARRANTY AVAILABLE

TECHNICAL DATASHEETS AVAILABLE

33250-2 SETAFLASH SERIES 3 ACTIVE COOL (CORROSION RESISTING)

- Corrosion resisting version of Setaflash 33200-2

The 33250-2 is similar to the 33200-2 with the addition of a corrosion resisting insert in the sample cup.

SUPPLIED WITH: 2ml syringe, mains lead and instruction manual.

FOR SPECIFICATIONS, ACCESSORIES & CONSUMABLES, SEE PAGE 14.

CALIBRATION & VERIFICATION MATERIALS

SETAPLUS EXTENDED WARRANTY AVAILABLE

TECHNICAL DATASHEETS AVAILABLE

33000-0 SETAFLASH SERIES 3 PLUS CLOSED CUP TESTER

ASTM D3278; D3828 ; D7236; E502; IP 303 (obs); IP 523; IP 524; IP 534; ISO DIN 3679; ISO 3680; BS EN 456; BS 3900 Part A13; BS 6664 Parts 3 & 4; UN Class 3 Non-viscous Flammable Liquids; CHIPS Regulations; EPA 1020 A & B; Classification of Dangerous Goods for Carriage: Viscous and Non Viscous Liquids

- Ramp mode for ASTM D7236 & IP 534
- Flash point test in less than 2 minutes
- Small sample size - 2 or 4ml
- Ambient to 300°C temperature range
- Automatic flash detection
- Audible and on-screen prompts
- Portable operation
- Simple calibration

33000-0 Setaflash 3 is an easy to use instrument that can complete a flash/no-flash test in less than two minutes, or determine the flash point of a sample within a temperature range of 0 to 300°C in typically 8 minutes.

All functions are accessed via a two button keypad and the Seta Multifunctional And Rotational Test (SMART) control feature. The digital display shows test parameters, instrument status, and the test result. An audible prompt is sounded when an action is required from the operator. An automatic flash detector reduces the chance of mis-interpretation of the test result by the operator, and enhances repeatability.

The temperature ramp mode allows rapid determination of the flash point of a sample in accordance with ASTM D7236 and IP 534. The cup is heated at a rate of 2°C per minute from the start temperature. An audible prompt to carry out a flash test occurs every 1°C rise up to 100°C, every 2°C rise over 100°C. For safety purposes, if no flash is detected when the temperature reaches 40°C above the start temperature, the flash tester automatically terminates the test. A new higher start temperature would have to be entered and the test started again.

Gas for the test jet/shutter assembly is supplied from an integral gas tank, which is filled using a standard butane (lighter) refill cartridge.

The instrument is lightweight and suitable for mobile use when operated from the optional 12 volt power supply adaptor.

SUPPLIED WITH: 2ml syringe, ignitor, mains lead and instruction manual.

Note: For close-to-ambient tests the sample cup requires cooling with 13870-0 Seta Coolant Module.

FOR SPECIFICATIONS, ACCESSORIES & CONSUMABLES, SEE PAGE 14.

33000-0

BIO-FUEL TESTING

CALIBRATION & VERIFICATION MATERIALS

SETAPLUS EXTENDED WARRANTY AVAILABLE

TECHNICAL DATASHEETS AVAILABLE

30000-0 SETAFLASH SERIES 3 CLOSED CUP TESTER

ASTM D3278; D3828 ; E502; IP 303 (obs); IP 523; IP 524; ISO DIN 3679; ISO 3680; BS EN 456; BS 3900 Part A13; BS 6664 Parts 3 & 4; CHIPS Regulations; EPA 1020 A & B; UN Class 3 Non-viscous Flammable Liquids; Classification of Dangerous Goods for Carriage: Viscous and Non Viscous Liquids

- Flash point test in less than 2 minutes
- Small sample size - 2 or 4ml
- Ambient to 300°C temperature range
- Cost effective
- Portable operation
- Simple calibration

The original Setaflash Series 3 tester. Basically a 33000-0 without the temperature ramp mode, the 30000-0 is a simple to use, reliable and cost effective instrument that is to be found in laboratories, refineries, storage and transport facilities world-wide.

SUPPLIED WITH: 2ml syringe, mains lead and instruction manual.

Note: For close-to-ambient tests the sample cup requires cooling with 13870-0 Seta Coolant Module.

FOR SPECIFICATIONS, ACCESSORIES & CONSUMABLES, SEE PAGE 14.

BIO-FUEL TESTING

CALIBRATION & VERIFICATION MATERIALS

SETAPLUS EXTENDED WARRANTY AVAILABLE

TECHNICAL DATASHEETS AVAILABLE

CALIBRATION CERTIFICATE (WORKS) (OPTIONAL)

1

SETAFLASH SMALL SCALE FLASH POINT

SPECIFICATIONS				
Seta Part No:	33200-2	33250-2	33000-0	30000-0
Temperature Range:	10 to 130°C (50 to 266°F)	10 to 130°C (50 to 266°F)	Ambient to 300°C (0 to 300°C with 13870-0)	Ambient to 300°C (0 to 300°C with 13870-0)
Cup Material:	Aluminium	Corrosion Resisting Steel Insert	Aluminium	Aluminium
Test Modes:	Rapid Equilibrium and Ramp	Rapid Equilibrium and Ramp	Rapid Equilibrium and Ramp	Rapid Equilibrium
Sample Size:	2ml for flash points up to 100°C 4ml for flash points above 100°C	2ml for flash points up to 100°C 4ml for flash points above 100°C	2ml for flash points up to 100°C 4ml for flash points above 100°C	2ml for flash points up to 100°C 4ml for flash points above 100°C
Test Duration, Rapid Equilibrium Mode:	1 minute below 100°C, 2 minutes above 100°C, or user determined 1 to 99 minutes	1 minute below 100°C, 2 minutes above 100°C, or user determined 1 to 99 minutes	1 minute below 100°C, 2 minutes above 100°C, or user determined 1 to 99 minutes	1 minute below 100°C, 2 minutes above 100°C
Ramp Rate:	2°C/min ramp	2°C/min ramp	2°C/min ramp	
Heating and Cooling System:	Peltier Cell	Peltier Cell	Cartridge heater	Cartridge heater
Power:	200W (maximum)	200W (maximum)	200W (maximum)	200W (maximum)
Voltage:	100/240V, 50/60Hz (switchable) 12Vdc with optional power adaptor	100/240V, 50/60Hz (switchable) 12Vdc with optional power adaptor	110/120V or 220/240V, 50/60Hz (switchable) 12Vdc with optional adaptor	110/120V or 220/240V, 50/60Hz (switchable) 12Vdc with optional adaptor
Gas Supply:	Laboratory gas, 3kPa (0.44psi) maximum pressure or Butane from optional Portable Gas Tank 13667-0	Laboratory gas, 3kPa (0.44psi) maximum pressure or Butane from optional Portable Gas Tank 13667-0	Laboratory gas, 3kPa (0.44psi) maximum pressure or Butane from optional Portable Gas Tank 13667-0	Laboratory gas, 3kPa (0.44psi) maximum pressure or Butane from optional Portable Gas Tank 13667-0
Size (HxWxD):	26 x 28 x 26cm	26 x 28 x 26cm	26 x 28 x 26cm	26 x 28 x 26cm
Weight:	5kg	5kg	4kg	4kg

ACCESSORIES – Setaflash Series 3

OPTIONAL		33200-2	33250-2	33000-0	30000-0
13666-0	BUTANE REFILL CYLINDER, pack of 24.	●	●	●	●
13746-0	DRAUGHT SCREEN, SETAFLASH, stainless steel, size (HxWxD) 36 x 48 x 24cm.	●	●	●	●
13747-0	SETA SOLID SAMPLE DISPENSER, *(for details see page 15).*	●	●	●	●
13770-311	SYRINGE, 4ml, for tests above 100°C.	●	●	●	●
13870-0	SETA COOLANT MODULE, to reduce temperature of cup below ambient down to 0°C. Uses dry ice and methanol freezing mixture.			●	●
13880-0	SETA METAL COOLING BLOCK, to cool cup after test.			●	●
26000-0	LIQUID RECOVERY SYSTEM, with pump and trap to extract and collect hot sample from cup, *(for details see page 15).*	●	●	●	●
30005-0	ADAPTOR FOR 12V POWER SUPPLY, 12Vdc to 230Vac			●	●
30006-0	CARRY CASE	●	●	●	●
33205-0	PORTABLE POWER ADAPTOR, 12Vdc to 19Vdc	●	●		
45001-0	SETAPLUS EXTENDED 12 MONTH WARRANTY	●	●	●	●
CALIBRATION, VERIFICATION & TRAINING					
13751-0	THERMOMETER, 0 to 110°C.	●	●	●	●
13775-0	THERMOMETER, 100 to 300°C.	●	●	●	●
99878-3	SMALL SCALE CERTIFIED FLASH POINT MATERIAL, *(for details see page 15).*	●	●	●	●
99928-0	SETATHERM, digital thermometer, -20 to 150°C, *(for details see page 129).*	●	●	●	●

CONSUMABLES – Setaflash Series 3

2 Years/2000 Tests		Qty 33250-2	Qty 33200-2	Qty 33000-0	Qty 30000-0
13730-005	SILICONE RUBBER TUBE, 4 metres.	1	1	1	1
13740-004	SAMPLE WELL 'O' RING, Viton, (pack of 5).	4	4	4	4
13740-009	SYRINGE, 2ml.	2	2	2	2
13740-017	HEAT SINK COMPOUND	1	1	1	1
13770-004	SAMPLE WELL 'O' RING, Silicone, (pack of 5).	4	4	4	4
13770-311	SYRINGE, 4ml, for tests above 100°C.	1	1	1	1
13740-425	FLASH DETECTOR	2	2	2	2

99878-3 SMALL SCALE CERTIFIED FLASH POINT MATERIAL

ASTM D3278; D3828; D7236; IP 523; IP 524; IP 534; BS 3900 Part A13; ISO 3679; ISO 3680; UN Class 3 Non-viscous Flammable Liquids

Small Scale Certified Flash Point Material is suitable for Closed Cup test methods and is produced in accordance with ISO Guides 34 and 35 for closed cup test methods.

Nominal certified flash point value 74°C (uncertainty 0.3°C).

Supplied in 50ml bottles.

CERTIFICATE OF MEASUREMENT (WORKS)

99878-3

13667-0 PORTABLE GAS TANK

- Re-fillable
- On-Off switch
- Controllable flow

A portable Butane gas supply suitable for Setaflash instruments. The tank incorporates an On/Off switch and an adjustable flow control valve. The tank is easy to refill from an Butane cartridge.

The 13667-0 is integral to Setaflash Series 3, and will connect directly to the gas inlet on 'Series 8'.

SUPPLIED WITH: 30cm length of gas tubing, stand, ignitor, and instruction manual.

Note: Also suitable for use with all older models of Setaflash and replaces the 13745-0 gas valve.

SPECIFICATIONS	
Flow Rate:	0 - 20g/hr (adjustable)
Gas:	Butane (standard gas lighter refill cartridge)
Size (HxDia):	23 x 2.5cm
Weight (filled):	150g (sufficient for approx. 90 mins)

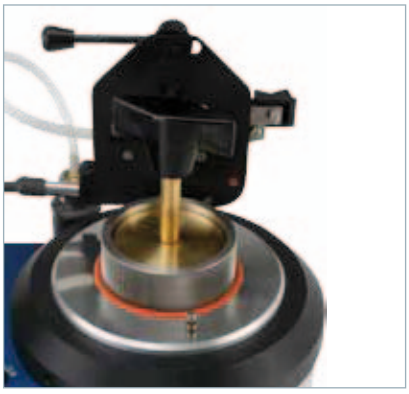
ACCESSORIES - Portable Gas Tank	
OPTIONAL	
13666-0	BUTANE REFILL CONTAINER, pack of 10.

13667-0 connected to a Setaflash Series 7

13747-0 SETA SOLID SAMPLE DISPENSER

- Consistent sample size
- Clean, mess free operation

Accurately loads solids, pastes, powders and other samples which cannot be discharged from a hypodermic syringe into closed cup testers.



13747-0 filling a Sample Cup

26000-0 LIQUID RECOVERY SYSTEM

- Safe removal of hot residue
- Collection of spillage

Although intended for the safe removal and collection of hot residue from flash and fire point testers, this item will fulfil many similar uses in the laboratory. Comprises a small suction pump with an insulated sample trap, connecting tubes, pick-up tube and stopper.

26000-0

1

SETAFLASH SMALL SCALE OPEN CUP FLASH POINT

Test methods specified under UN and IATA Dangerous Goods Regulations, and others, determine whether a liquid sustains combustion when heated and exposed to a flame under specified test conditions. Certain substances classified as Flammable by Closed Cup Flash Point Testing may be reclassified as non-flammable by combustibility testing. This has significant potential cost implications for the packaging, storage and shipping of many substances.

31000-0 SETAFLASH SERIES 3 OPEN CUP TESTER

ASTM D4206; BS 3900 Part A11; ISO 9038; UN Class 3 Test L. 2; CFR 49-173.120; IATA Dangerous Goods Regs. Section 3.3.5; Health and Safety Comm. Carriage of Dangerous Goods by Road & Rail App. B

- Flash point test in less than 2 minutes
- Small sample size - 2ml
- Ambient to 300°C temperature range
- Audible and on-screen prompts
- Portable operation
- Simple calibration

The Setaflash 31000-0 is a simple to use and reliable open cup tester for flash/no flash, finite determinations or sustained combustion tests within a range of ambient to 300°C.

The manually operated flame sweeping arm is supplied from an integral gas tank that is filled using a standard butane (lighter) refill cartridge. The flash or sustained combustion characteristics of the sample are observed visually while the test flame is passed over the sample.

All functions are accessed via a two button keypad and the Seta Multifunctional And Rotational Test (SMART) control feature. The digital display shows test parameters and instrument status. An audible prompt is sounded when an action is required from the operator.

The instrument is lightweight and suitable for mobile use when operated from the optional 12 volt power supply adaptor.

SUPPLIED WITH: 2ml syringe, test flame height gauge, mains lead and instruction manual.

31000-0

BIO-FUEL TESTING

CALIBRATION & VERIFICATION MATERIALS

SETAPLUS EXTENDED WARRANTY AVAILABLE

TECHNICAL DATASHEETS AVAILABLE

SPECIFICATIONS	
Temperature Range:	Ambient to 300°C
Sample Size:	2ml
Test Time:	1 to 99 minutes
Default Values:	1 minute for flash points up to 100°C 2 minutes for flash points between 100 to 300°C
Cup Material:	Blackened Aluminium
Voltage:	110/120V or 220/240V, 50/60Hz (switchable) 12V using optional power supply
Size (HxWxD):	25.6 x 28 x 25.6cm
Weight:	4kg

ACCESSORIES - Setaflash Series 3 Open Cup Tester

OPTIONAL

13666-0	BUTANE REFILL CYLINDER, pack of 10.
13746-0	DRAUGHT SCREEN, SETAFLASH, size (HxWxD) 36 x 48 x 24cm, stainless steel.
26000-0	LIQUID RECOVERY SYSTEM, with pump and trap to extract and collect hot sample from cup, (*for details see page 15*)
30005-0	ADAPTOR FOR 12V POWER SUPPLY
30006-0	CARRY CASE, size (HxWxD) 21 x 40 x 30cm.
45000-0	SETAPLUS EXTENDED 12 MONTH WARRANTY

CALIBRATION, VERIFICATION & TRAINING

13751-0	THERMOMETER, 0 to 110°C.
13775-0	THERMOMETER, 100 to 300°C.
99928-0	SETATHERM, digital thermometer, -20 to 150°C, (*for details see page 129*).

CONSUMABLES - Setaflash Series 3 Open Cup Tester

2 Years/2000 Tests		Qty
13730-005	SILICONE RUBBER TUBE, 4 metres.	2
13740-009	SYRINGE, 2ml	1

13220-2 SETA TAG CLOSED CUP TESTER

ASTM D56; D3934; D3941; E502; BS 3900 Parts A8 & A9; FTM 791 1101

- Ambient to 93°C temperature range
- Variable ramp rate
- 500ml Bath

The 13220-2 comprises an electrically heated liquid bath, variable ramp rate controller, metal sample cup and a lid with test jet and shutter. The test flame uses either mains gas or can operate from a 13667-0 Portable Gas Tank. The case features an integral drip tray and a bath overflow.

SUPPLIED WITH: instruction manual and mains lead.

CALIBRATION & VERIFICATION MATERIALS

SETAPLUS EXTENDED WARRANTY AVAILABLE

13220-2 (Thermometers supplied separately)

13230-3 SETA SEMI-AUTOMATIC TAG OPEN CUP TESTER

ASTM D1310; D3413

- Ambient to 93°C temperature range
- Variable ramp rate
- Electrically driven sweep arm

The 13230-3 comprises an electrically heated liquid bath, variable ramp rate controller, glass sample cup and a button-operated, electrically driven sweep arm with test jet. The test flame uses either mains gas or can operate from a 13667-0 Portable Gas Tank. The case features an integral drip tray and a bath overflow.

SUPPLIED WITH: instruction manual and mains lead.

CALIBRATION & VERIFICATION MATERIALS

SETAPLUS EXTENDED WARRANTY AVAILABLE

13230-3 (Thermometers supplied separately)

ACCESSORIES - TAG Flash Point Testers

REQUIRED		13220-2	13230-3
13740-0	SETA THERMOMETER FERRULE AND ADAPTOR, to mount thermometers, pack of 2.	●	
THERMOMETERS: ASTM9C/IP15C or ASTM57C		●	
ASTM9C/IP15C or ASTM33C/IP20C or ASTM35C/IP59C			●
OPTIONAL			
13666-0	BUTANE REFILL CONTAINER, pack of 10.	●	●
13667-0	PORTABLE GAS TANK, with on/off switch regulator and ignitor. Suitable for use with Butane refill 13666-0 containers.	●	●
71001-0	SETA-VENT, portable fume extractor and draught excluder, excluding flexible ducting.	●	●
99910-0	PORTABLE DIGITAL BAROMETER, 750 to 1150 mbar absolute, *(for details see page 145).*	●	●
45000-0	SETAPLUS EXTENDED 12 MONTH WARRANTY	●	●
Note: Other items which may be required include: Ethylene glycol, 50ml graduated measure.			
CALIBRATION, VERIFICATION & TRAINING			
99880-0	FLASHCHECK, pack of 3, *(for details see page 156).*	●	●

SPECIFICATIONS

Seta Part No:	13220-2	13230-3
Cup Type:	Closed Cup	Open Cup
Temperature Range:	Ambient to 93°C	Ambient to 93°C
Ramp Rate:	Variable, manually controlled	Variable, manually controlled
Bath fluid:	500ml Water or Silicone Fluid	500ml Water or Silicone Fluid
Power:	500W maximum	500W maximum
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz	110/120V, 50/60Hz 220/240V, 50/60Hz
Size (HxWxD):	33 x 31 x 29cm	33 x 31 x 29cm
Weight:	5kg	6kg

CONSUMABLES - TAG Flash Point Testers

2 Years/2000 Tests		Qty 13220-2	Qty 13230-3
11870-001	HEAT CONTROLLER		1
13220-002	TEST CUP	5	
13230-002	GLASS SAMPLE CUP		2
13730-005	SILICONE RUBBER TUBE, 4 metres.	1	1

PENSKY-MARTENS FLASH POINT

13661-3 SETA PENSKY-MARTENS CLOSED CUP TESTER

ASTM D93; E502; IP 34; IP 35; IP 404 (obs); EN 22719; ISO 2719; ISO 15267; BS 2000 Parts 35 & 404 (obs); AASHTO T73-811; NF M07-019; JIS K2265; FTM 791 1102

- Ambient to 370°C temperature range
- Variable ramp rate
- Two speed stirrer
- Forced air cooling facility

A Pensky-Martens closed cup flash point tester with an electrically heated cup, adjustable temperature ramp rate, and two speed stirrer.

Suitable for use with mains gas or Seta 13667-0 gas canister. A compressed air supply can be attached to the rear of the instrument to allow rapid cooling in between tests.

SUPPLIED WITH: sample cup, lid and shutter stand and instruction manual.

BIO-FUEL TESTING

CALIBRATION & VERIFICATION MATERIALS

SETAPLUS EXTENDED WARRANTY AVAILABLE

13661-3 (Thermometer supplied separately)

ACCESSORIES - Pensky-Martens

OPTIONAL

13470-0	SETA THERMOMETER FERRULE AND ADAPTOR, to mount thermometers, pack of 2.
13663-0	SETARAMP CONTROLLER, for optional automated temperature control.
13664-0	PROBE ASSEMBLY, for use with 13663-0, (Pensky-Martens).
13665-0	OPEN FLASH CLIP AND THERMOMETER COLLAR, converts to open cup for IP 35; BS 2000 Part 35.
13666-0	BUTANE REFILL CONTAINER, pack of 10.
13667-0	PORTABLE GAS TANK, with on/off switch regulator and ignitor (use with Butane refill container 13666-0).
71001-0	SETA VENT, portable fume extractor and draught excluder, excluding flexible ducting.
99910-0	PORTABLE DIGITAL BAROMETER, 750 to 1150 mbar absolute, *(for details see page 145).*
45000-0	SETPLUS EXTENDED 12 MONTH WARRANTY

THERMOMETERS:

ASTM9C/IP15C or ASTM9F/IP15F or ASTM10C/IP16C or ASTM10F/IP16F or ASTM88C or ASTM88F

CALIBRATION, VERIFICATION & TRAINING

99851-0	MULTI-TEST VERIFICATION MATERIAL, ASTM D93 - IP 34 Gas Oil, *(for details see page 150).*
99853-0	MULTI-TEST VERIFICATION MATERIAL, ASTM D93 - IP 34 Gas Oil, *(for details see page 151).*
99908-0	BIO MULTI TEST VERIFICATION MATERIAL, Gas Oil, *(for details see page 151).*
99880-0	FLASHCHECK, pack of 3, *(for details see page 156).*
99960-0	DIGITAL PHOTO TACHOMETER, *(for details see page 147).*

SPECIFICATIONS

Stirrer:	Two speed, for ASTM D93-IP 34, Methods A and B.
Temperature range:	Ambient to 370°C
Ramp Rate:	Variable, manually controlled
Power:	600W
Voltage:	110/120V, 60Hz 220/240V, 50/60Hz
Size (HxWxD):	32 x 31 x 29cm
Weight:	8kg

CONSUMABLES - Pensky-Martens

2 Years/2000 Tests		Qty
13730-005	SILICONE RUBBER TUBE, 4 metres	1
13661-301	PENSKY-MARTENS CUP	1

ABEL CLOSED CUP FLASH POINT

13032-3 SETA ABEL FLASH POINT TESTER

IP 170; IP 33 (obs); BS 2000 Parts 33 (obs) & 170; ISO 13736

- Conforms to the design of the 'original' Abel flash point tester
- IP 74C and IP 75C thermometers included (IP 170 tests)

A copper water bath, oil cup, gas test jet, manual stirrer, and timing pendulum fitted in a sturdy case.

SUPPLIED WITH: thermometers for the oil cup and water bath, and instruction manual.

ACCESSORIES - Abel Flash Point Tester

OPTIONAL

13035-0	SETA HEATER ASSEMBLY, stainless steel case with halogen lamp heaters.
13180-3	SETA ELECTRIC STIRRER, for IP 170. Comprises geared stirrer motor, flexible drive, boss head and stand.
13666-0	BUTANE REFILL CONTAINER, pack of 10.
13667-0	PORTABLE GAS TANK, with on/off switch regulator and ignitor, (use with Butane refill container 13666-0).
22650-0	SETA ENERGY REGULATOR, for heat output control of 13035-0 heater.
71001-0	SETA VENT, portable fume extractor and draught excluder, excluding flexible ducting.

THERMOMETERS:

13140-0	IP74F, with collar, for tests to IP 33 only, pack of 2.
13150-0	IP2F, with collar, for tests to IP 33 only, pack of 2.
13160-0	IP75F, with collar, for tests to IP 33 only, pack of 2.

CALIBRATION, VERIFICATION & TRAINING

99850-0	MULTI-TEST VERIFICATION MATERIAL, IP 170 Kerosine, *(for details see page 150).*

13032-3

CALIBRATION & VERIFICATION MATERIALS

SPECIFICATIONS

Size (HxWxD):	31 x 23 x 18cm
Weight:	2.3kg

CLEVELAND OPEN CUP FLASH POINT

13811-3 SETA SEMI-AUTOMATIC CLEVELAND OPEN CUP TESTER

ASTM D92; IP 36; EN ISO 2592; BS 2000 Parts 36 & 403 (obs); NF T60-118; FTM 791 1103.7; JIS K2265; AASHTO T48

- Ambient to 400°C temperature range
- Variable ramp rate
- Electrically driven sweep arm

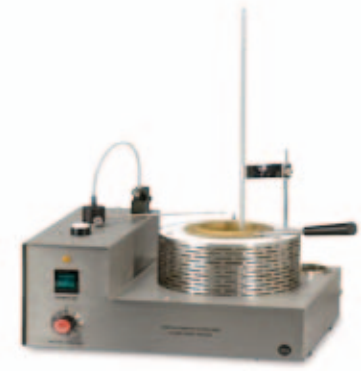
The 13811-3 comprises an electrically heated sample cup, variable ramp rate controller, and a button-operated, electrically driven sweep arm with test jet.

The test flame uses either mains gas or can operate from a 13667-0 Portable Gas Tank.

SUPPLIED WITH: instruction manual and mains lead.

CALIBRATION & VERIFICATION MATERIALS

SETAPLUS EXTENDED WARRANTY AVAILABLE



13811-3 (Thermometer supplied separately)

ACCESSORIES - Cleveland

OPTIONAL

13663-0	SETARAMP CONTROLLER, for optional automated temperature control.
13815-0	PROBE ASSEMBLY, for use with 13663-0, (Cleveland).
13666-0	BUTANE REFILL CONTAINER, pack of 10.
13667-0	PORTABLE GAS TANK, with on/off switch regulator and ignitor. Suitable for use with Butane refill 13666-0 containers.
71001-0	SETA-VENT, portable fume extractor and draught excluder, excluding flexible ducting.
99910-0	PORTABLE DIGITAL BAROMETER, 750 to 1150 mbar absolute, *(for details see page 145).*
45000-0	SETAPLUS EXTENDED 12 MONTH WARRANTY

THERMOMETERS:

ASTM11C/IP28C or ASTM 11F/IP28F

CALIBRATION, VERIFICATION & TRAINING

99880-0	FLASHCHECK, pack of 3, *(for details see page 156).*

SPECIFICATIONS

Temperature range:	Ambient to 400°C
Power:	600W maximum
Ramp Rate:	Variable, manually controlled
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Size (HxWxD):	33 x 31 x 29cm
Weight:	6.5kg

CONSUMABLES - Cleveland

2 Years/2000 Tests	Qty
13730-005	SILICONE RUBBER TUBE, 4 metres. 1
13800-001	TEST CUP.....1

FLASH POINT ACCESSORIES

13663-0 SETARAMP CONTROLLER

- Automated temperature control for Seta 13811-3 and 13661-3 testers
- Programmable
- Audible prompt

13663-0 is an automated temperature control unit for Seta 13811-3 and 13661-3 flash point testers.

The start temperature, ramp rate (°C/min) and test temperature interval (°C) are entered by the operator via a keypad. A digital display shows the parameters set, and the temperature of the sample.

Setaramp overrides the flash tester's on-board controller, giving more accurate ramp rates and set points. An audible prompt is given at each test temperature interval.

Note: Ramp temperature may be difficult to control during Cleveland tests when testing liquids with a viscosity >800cSt at 25°C.

13663-0

SPECIFICATIONS

Ramp rate:	Variable, user definable (within the time and temperature limits of the flash point tester), automatically controlled
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Size (HxWxD):	6 x 34 x 32cm
Weight:	3kg

71001-0 SETA-VENT

- Draught shield with fume extractor

The Seta-Vent is suitable for use with any of the Seta range of Flash Point Testers, and is ideal for use where undesirable fumes need to be removed or where protection from air currents is required.

The unit incorporates fan and controller and can be dismantled for easy storage when not in use.

Note: Flexible ducting is not supplied.

71001-0

SPECIFICATIONS

Vent tube:	50mm outside diameter
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Size (HxWxD):	52 x 52 x 40cm
Weight:	8kg

1

SMOKE POINT

10400-0 SETA SMOKE POINT APPARATUS

ASTM D1322; IP 57; BS 2000 Part 57; ISO 3014; NF M07-028

- Robust construction
- Clear scale

An instrument for determining the smoke point of kerosine and aviation turbine fuel by measuring the maximum flame height prior to smoke formation and comparing the results with those of known standards.

The smoke point gives an indication of aromatic content and radiant heat transfer characteristics and has good correlation with ASTM D1740 (Luminometer number).

Comprises a tripod stand, lamp body, and chimney. The measuring scale is viewed through a curved glass window on the front of the instrument. A mirror (10450-0) can be attached to the chimney to aid smoke detection.

SUPPLIED WITH: candle assembly and certified wick.

SPECIFICATIONS	
Size (HxWxD):	47 x 21 x 19cm
Weight:	2.6kg

CONSUMABLES – Smoke Point App.	
2 Years/2000 Tests	Qty
10400-004 WICK TUBE	1

CALIBRATION & VERIFICATION MATERIALS

10400-0 with 10450-0 Mirror (Supplied separately)

ACCESSORIES – Smoke Point Apparatus	
REQUIRED	
10450-0	SETA MIRROR, for fixing to chimney to detect first indication of smoke.
OPTIONAL	
10410-0	SETA WICK TRIMMER, inserts wick and automatically sets to correct length.
10425-0	WICK EXTRACTION APPARATUS, (for details see below).
10430-0	SETA INSTRUMENT CASE, for lamp assembly, stand and five candles.
CALIBRATION, VERIFICATION & TRAINING	
99850-0	MULTI-TEST VERIFICATION MATERIAL, ASTM D1322 Kerosine, *(for details see page 150).*

10410-0

10425-0 WICK EXTRACTION APPARATUS

ASTM D1322; IP 57

- Simple and safe to use
- In accordance with test method

The test methods require that wicks used in the smoke point apparatus are extracted in a 50/50 mix of toluene and anhydrous methanol.

The 14025-0 comprises a 60ml soxhlet extractor, condenser, 500ml glass flask, flask heater, stand and clamp.

SPECIFICATIONS	
Power:	200W
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Size (HxWxD):	45 x 30 x 15cm
Weight:	3kg

TECHNICAL DATASHEETS AVAILABLE

ACCESSORIES – Wick Extraction Apparatus	
OPTIONAL	
99200-2	LABORATORY OVEN, *(for details see page 137).*
99205-0	DESSICATOR, 200ml and Disc, *(for details see page 137).*

Note: Other items which may be required include: Toluene and Anhydrous methyl alcohol.

10425-0

10510-0 SETA ADLAKE BURNING TEST LAMP

ASTM D187; IP 10; BS 2000 Part 10; FTM 791 2106

Provides information on the burning properties of kerosine, particularly for illumination.

Comprising a fabricated sheet metal oil reservoir, brass burner, glass chimney and wick.

SUPPLIED WITH: two spare chimneys and a pack of 10 certified wicks.

SPECIFICATIONS	
Size (HxWxD):	31 x 20 x 18cm
Weight:	1.4kg

10510-0

ACCESSORIES – Smoke Point Apparatus

REQUIRED

10500-0 SETA FLAME GAUGE, *(for details see below).*

OPTIONAL

99100-2 ANALYTICAL BALANCE, *(for details see page 141).*

99200-2 LABORATORY OVEN, *(for details see page 137).*

Note: Other items which may be required include: 19mm paraffin flat wicks, de-natured ethanol, dilute hydrochloric acid and precipitation naphtha.

10500-0 SETA FLAME GAUGE

ASTM D187

A gauge for measuring the height and width of a flame. Mounted on a tripod base and adjustable height support column. Hinged and adjustable with stops for true horizontal and vertical readings.

SUPPLIED WITH: two spare chimneys and a pack of 10 certified wicks.

SPECIFICATIONS	
Size (HxWxD):	35 x 25 x 25cm
Weight:	2.7kg

10500-0

BURNING RATE TEST

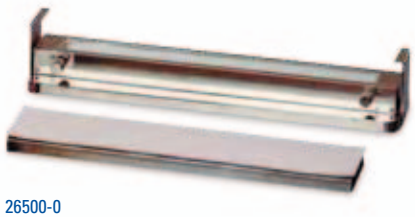
26500-0 SETA BURNING RATE TEST RIG

UN Class 4. Division 4.1 Burning Rate Test Method; IATA Dangerous Goods Regulation, Section 3.4.2; EPA 130; Health & Safety Commission, Carriage of Dangerous Goods by Road & Rail 1994, Appendix D; US Department of Transport CFR 40-173, Appendix E

- Classification of flammable solids
- Preliminary screening
- Burning test rate

Laws governing the packaging and transport of dangerous goods require that substances are identified according to the nature of the potential hazard. The Burning Rate Test Rig is used to determine the classification of flammable solids such as powders, granules and pastes. Comprising a mould, supporting frame, sample shovel, tray with measuring rule, conducting plate and duratec paper.

SPECIFICATIONS	
Size (HxWxD):	6 x 31 x 7cm
Weight:	3.5kg



26500-0

ACCESSORIES – Burning Rate Test

OPTIONAL

13802-0 SETA GAS BURNER, universal, for Natural (methane), Coal and Butane.

22750-2 DIGITAL STOPWATCH, *(for details see page 141).*

71001-0 SETA-VENT, (*for details see page 19*).

99900-0 SETA SAFETY SPECS, pack of 4, *(for details see page 145).*

MULTI-MODE

2

80000-0 SETAVAP ANALYSER

ASTM D5188; D5191; IP 394; IP 409; EN 13016-1; EN 13016-2 (37.8°C)
Correlates with:
ASTM D323; D2533; D4953; D5482; D6378; IP 69; IP 402 (obs); ISO 3007; EN 12 (obs); JIS K2258; NF M07-079

- Five vapour pressure modes, including Reid
- Vapour-Liquid ratio mode
- Automatic operation
- Selectable units
- Integral printer
- RS232 interface

CALIBRATION & VERIFICATION MATERIALS

TECHNICAL DATASHEETS AVAILABLE

80000-0

An automatic multi-mode vapour pressure tester with a pressure range of 0 to700kPa (0 to 100psi) and a temperature range of 25°C (45°F) below ambient to 100°C (212°F).

Five vapour pressure test modes, including a Reid vapour pressure mode, allow single or multiple vapour pressure tests to be carried out on a sample at static, ramping or stepped temperatures. A vapour-liquid mode enables the user to determine the temperature required to produce a pre-set pressure.

All functions are accessed via a membrane keypad/digital display, while audible and visual prompts advise the status of the instrument and progress of the tests. Units of pressure can be presented in kPa, psi (lbf/in²), kg/cm², mbar, mmHg, or inHg, and units of temperature can be set to °C or °F.

The Setavap Analyser is fully automatic apart from the injection of sample. To ensure gas tight operation, the septum is in strip form and automatically advances for each test. A septum strip is sufficient for up to 50 tests.

At the end of the test the sample is automatically drained and the test results, with time, date, and sample identity, are output via the integral printer and RS232 port.

Calibration is automated and can be carried out at either full vacuum, atmospheric pressure, or high pressure. A calibration certificate can be printed out.

SUPPLIED WITH: 5ml syringe, 3 needles, 3 septum strips, paper/ink package, flask, mains lead and instruction manual.

SPECIFICATIONS

Test Temperature Range:	25°C below ambient to 100°C (45°F below ambient to 212°F)
Temperature Resolution:	0.1°C (0.2°F)
Units of Temperature:	°C or °F
Test Pressure Range	0 to 700kPa
Pressure Resolution:	0.1kPa (0.1psi)
Units of Pressure:	kPa, psi (lbf/in²), kg/cm², mbar, mmHg, inHg (User selectable)
Reid Mode:	Display shows RVP equivalent
Chamber Volume:	15ml ±1%
Vacuum Requirement::	better than 0.01kPa (abs)
Computer Interface:	RS232C
Voltage:	110/120V or 220/240V, 50/60Hz (Switchable)
Power:	200W
Size (HxWxD):	35 x 45 x 37cm
Weight:	22.8kg

CONSUMABLES - Setavap Analyser

2 Years/2000 Tests		Qty
40000-007	PAPER/INK PACKAGE	12
80000-016	SEPTUM STRIP, pack of 5	8
80000-017	FLASK, USED SAMPLE, pack of 5	4
81003-001	SYRINGE, 5ml c/w LeurLock	1
81003-002	NEEDLE for 81003-001, pack of 2	1
80009-0	SYRINGE, 1ml c/w LeurLock and needle	2

ACCESSORIES - Setavap Analyser

REQUIRED

22422-6	VACUUM PUMP, (*for details see page 136*).

OPTIONAL

80003-0	TRANSFORMER, for use where electrical supply falls below 105V.
80004-0	VACUUM PUMP (*for details see page 136*).
80009-0	SYRINGE, 1ml c/w LeurLock and needle.
93700-2	LABORATORY REFRIGERATOR, (*for details see page 140*).

CALIBRATION, VERIFICATION & TRAINING

80005-2	PRESSURE CALIBRATOR, recommended for recalibrating when testing above 200kPa, (*for details see page 25*).
80007-3	MCLEOD GAUGE, (*for details see page 146*).
99910-0	PORTABLE DIGITAL BAROMETER, 75 to 115kPa absolute (*for details see page 145*).
99922-0	DIGITAL THERMOMETER, (*for details see page 130*).

MULTI-MODE

2

81000-2 SETAVAP 2

ASTM D5191; IP 394; IP 409 (37.8°C); IP 481; EN 13016-1; EN 13016-2 (37.8°C)
Correlates with: D323; D4953; D5482; D6378; IP 69; IP 402 (obs); ISO 3007; EN 12 (obs); JIS K2258; NF M07-079

- Rapid automatic vapour pressure testing
- Automatic drain and purge
- "Mini" method uses only 3ml sample size
- Selectable units - kPa or psi
- Results available as Ptot, DVPE, EPA, Crude, Pabs
- Audible and on-screen prompts
- RS232 interface

The Setavap 2 is an automated instrument for the measurement of the vapour pressure of gasoline, solvents, light crude oils, and other similar products using the "Mini" test method.

Fully evacuated chamber technology guarantees that the sample is tested under a full vacuum, as required by the "Mini" test methods, unlike the expansion technologies that rely on moving pistons.

All functions are accessed via a two button keypad and a rotary control. The digital display leads the operator through the test sequence, displays the instrument status and the test results. An audible prompt is sounded when an action is required from the operator.

A sample is injected through a septum into a fixed volume chamber that is maintained at 37.8°C ± 0.1°C. The vapour to liquid ratio is 4:1. The pressure is automatically measured at one minute intervals until three readings are within 0.1 kPa, which determines the end of the test.

Results can be displayed as total pressure (Ptot), dry vapour pressure equivalent (DVPE), EPA requirements, or Reid (crude) using pre-programmed correlation equations, and may be printed via the integral RS232 port and optional 81002-0 printer. A facility is included to allow two part tests (Pabs) to be conducted at 37.8°C.

All valve operations are automated including sample draining and chamber venting and purging. The valves utilise solvent resistant Kalrez seals.

Calibration of temperature and pressure is automated and simple to carry out.

SUPPLIED WITH: Septum holder, waste container, mains lead, and instruction manual.

SPECIFICATIONS	
Test Temperature:	38.7°C (100°F) ± 0.1°C
Test Pressure Range:	0 to 200kPa ± 0.5kPa (0 to 29psi ± 0.1psi)
Pressure Resolution:	0.1kPa (0.1psi)
Sample Size:	3ml
Vapour to Liquid Ratio:	4:1
Display Units of Pressure:	kPa or psi (User selectable)
Vacuum Requirement::	better than 0.01kPa (abs)
Voltage:	110/120V or 220/240V, 50/60Hz (switchable)
Power:	70W
Size (HxWxD):	37 x 13 x 20cm
Weight:	3.5kg

81000-2 with 81003-0

CALIBRATION & VERIFICATION MATERIALS

SETALERT COMPATIBLE

SETAPLUS EXTENDED WARRANTY AVAILABLE

TECHNICAL DATASHEETS AVAILABLE

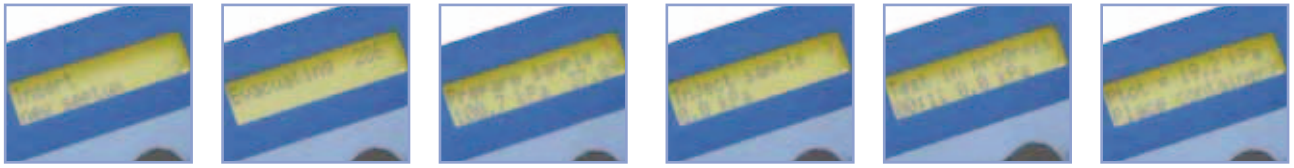
ACCESSORIES - Setavap 2

REQUIRED	
22422-6	VACUUM PUMP
22420-033	SEPTUM, pack of 250 *(1 required per test).*
81003-0	SYRINGE, 5ml and needles.
OPTIONAL	
80004-0	VACUUM PUMP (for details see page 136).
81002-2	PRINTER
93700-2	LABORATORY REFRIGERATOR, *(for details see page 140).*
45000-0	SETAPLUS EXTENDED 12 MONTH WARRANTY
CALIBRATION, VERIFICATION & TRAINING	
80007-3	MCLEOD GAUGE, *(for details see page 146).*
80008-0	DIGITAL VACUUM GAUGE, *(for details see page 148).*
99910-0	PORTABLE DIGITAL BAROMETER, 75 to 115kPa absolute, *(for details see page 145).*
99922-0	DIGITAL THERMOMETER, *(for details see page 130).*

CONSUMABLES - Setavap 2

2 Years/2000 Tests		Qty
22420-033	SEPTUM, pack of 250	3
81003-0	SYRINGE, 5ml and needles	1
81003-001	SYRINGE, 5ml, c/w LeurLock	1
81003-002	NEEDLE for 81003-001, pack of 2	1

81000-2 Test Sequence



REID VAPOUR PRESSURE (RVP)

2

22210-3 SETA REID VAPOUR PRESSURE BATH

ASTM D323 Procedures A, C & D; D1267; D4953 Procedure A; IP 69 Procedures A, C & D; IP 402 (obs); IP 410; BS 2000 Parts 69, 402 (obs), 410, ISO 3007; ISO 4256; EN 12 (obs); FTM 791 1201; NF 12 (obs); NF M07-007; NF M41-010 (LPG); JIS K2258

- Accepts up to 6 pressure cylinder assemblies
- Temperature range ambient +5°C to 90°C (194°F)
- Uniformity better than ± 0.1°C @ 37.8°C (± 0.2°F @ 100°F)
- Digital temperature control
- Low fluid level and over-temperature protection

22210-3
(Cylinders & gauges supplied separately)

A floor standing water bath specifically designed for the determination of vapour pressure with Seta Reid or Seta Vapour pressure cylinders.

The stainless steel 80 litre water bath has a temperature range of ambient +5°C to 90°C and can achieve a test temperature of 37.8°C (100°F) with a uniformity of ±0.1°C (0.2°F).

A programmable, digitally controlled thermostir unit combines the functions of heater, temperature controller, timer and stirrer. The thermostir unit is equipped with an RS 232 port, a switched output for an external relay, a socket for an external PT100 temperature probe and alarms and cut-outs for low fluid level and over-temperature.

The 22210-3 will accept up to four 22410-0 and up to six 22400-0 Seta Vapour Pressure Cylinder / Ullage Chamber assemblies.

SUPPLIED WITH: 4 pressure cylinder mounting brackets, mains lead and instruction manual.

SPECIFICATIONS	
Test Temperature Range:	ambient +5°C to 90°C (9°F below ambient to 194°F)
Temperature Uniformity:	±0.1°C @ 37.8°C
Bath Volume:	80 litre
Bath Fluid:	Water (De-ionised)
Cylinder Capacity:	Up to 6 cylinder assemblies
Voltage:	220/240V, 50/60Hz
Power:	2.2kW
Size (HxWxD):	77 x 55 x 51cm
Weight:	70kg

ACCESSORIES – RVP Bath

REQUIRED - Gasoline & Volatile Crude Oil

PRESSURE CYLINDER
Select from RVP CYLINDERS below.
THERMOMETERS
ASTM18C/IP23C

REQUIRED - LPG

PRESSURE CYLINDER & ULLAGE CHAMBER
Select from VAPOUR PRESSURE CYLINDERS on page 26.
THERMOMETERS
ASTM65C

OPTIONAL

22210-301 VESSEL SUPPORT BRACKET, for extra cylinders, stainless steel, pack of 2.

RVP CYLINDERS

ASTM D323; D4953 Procedure 'A'; IP 69; IP 402 (obs); BS 2000 Part 69 & 402 (obs); EN 12 (obs); FTM 791 1201; ISO 3007; NF M07-007; JIS K2258

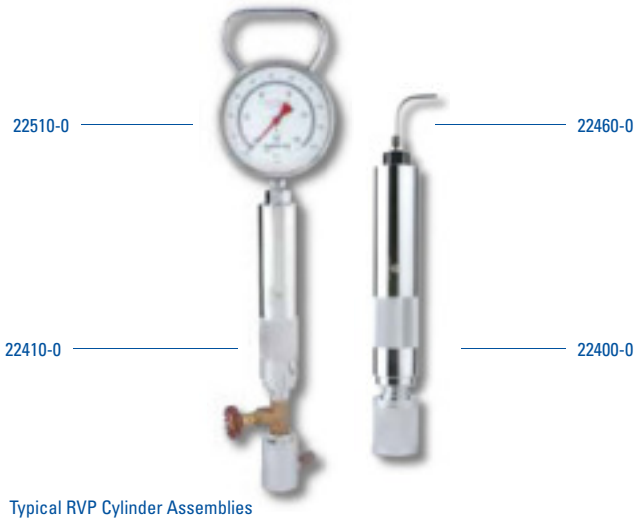
- Reid vapour pressure of non-viscous petroleum products and volatile crude oil
- Accurate chamber volume ratio
- Quick leak-free bayonet connection between chambers
- Chromium-plated brass construction

22400-0 SETA REID PRESSURE CYLINDER ASSEMBLY

- Pressures up to 180kPa (26psi)
- ASTM D323 & IP 69 Procedures A & D
- Hydrostatically pressure tested to 690kPa (100psi)

22410-0 SETA REID PRESSURE CYLINDER ASSEMBLY

- Pressure range 180 to 700kPa (26 to100psi)
- ASTM D323 & IP 69 Procedure C
- ½ inch gate valve between gasoline and air chambers
- ¼ inch needle valve to gasoline chamber
- Hydrostatically pressure tested to 1380kPa (200psi)



Typical RVP Cylinder Assemblies
(Gauge and Manometer Adaptor supplied separately)

ACCESSORIES – Reid Pressure Cylinder Assembly

REQUIRED

PRESSURE GAUGES
Select from SETA RVP GAUGES on page 25.

OPTIONAL

22460-0 SETA MANOMETER ADAPTOR, adapts customer's manometer to Seta 22400-0 Pressure Cylinder using plastic/rubber tubing, pack of 2.

CHARGING SYSTEMS
Select from TANK SAMPLING EQUIPMENT FOR RVP on page 123.

RVP GAUGES

2

SETA REID VAPOUR PRESSURE GAUGES

22510-0

ASTM D323; IP 69; BS 2000 Part 69

- Pressures up to 700kPa (100psi)
- Accuracy ±1% fsd
- 150mm dial
- Mirror scale in kPa and psi
- ¼ inch BSP fitting
- Sturdy handle

CALIBRATION CERTIFICATE (WORKS)

A range of Bourdon-Tube type pressure gauges with 150mm diameter mirror band dials to eliminate paralax errors while reading. The graduations are marked in kPa and psi (lbf/in²).

The gauges have a bottom entry ¼ inch BSP fitting and a heavy duty stainless steel case with a large carrying handle suitable for lifting a complete pressure vessel assembly from a bath.

The gauges conform to EN 837 S2, Accuracy Class 1 ±1%fsd.

SETA REID VAPOUR PRESSURE GAUGES

Seta Part	Scale Range		Division		Sub-Division	
	kPa	psi	kPa	psi	kPa	psi
22500-0	0 to 35	0 to 5	5	1	0.5	0.1
22510-0	0 to 100	0 to 15	10	3	0.5	0.1
22520-0	0 to 200	0 to 30	25	5	1	0.2
22530-0	0 to 300	0 to 45	25	5	1	0.2
22540-0	0 to 400	0 to 60	50	10	1.5	0.25
22550-0	0 to 700	0 to 100	50	10	2	0.5

RVP VERIFICATION INSTRUMENTS

22430-3 SETA PRE-PRESSURISED MANOMETER

- Verification of pressure gauge up to 135kPa (19.5psi)
- 0.2kPa graduations

Mercury type, unbreakable plastic construction, wall mounting.

SUPPLIED WITH: needle valve, isolation valve, quick release coupling, neoprene tube and instruction manual.

Note: Supplied without mercury.

CALIBRATION CERTIFICATE (WORKS)

22430-3

22470-3 SETA MANOMETER

- Verification of pressure gauge up to 135kPa (19.5psi)
- 0.5kPa graduations

Mercury type, unbreakable plastic construction, wall mounting.

Note: Supplied without mercury.

CALIBRATION CERTIFICATE (WORKS)

80005-2 SETA PRESSURE CALIBRATOR

- For verification above 180kPa (26psi)
- Accuracy ± 0.015% indicated pressure

A deadweight tester with integral handpump and pressure gauge.

SUPPLIED WITH: set of calibrated weights.

Note: Refer to Section 22, CALIBRATION, for more details.

CALIBRATION CERTIFICATE (UKAS)

VAPOUR PRESSURE CYLINDERS

2

ASTM D1267; IP 161 (obs); IP 410; BS 2000 Part 410; EN ISO 4256; NF M41-010

- Pressure Tested & UKAS Certified to 6900kPa (1000psi)
- Stainless steel construction

22300-2 SETA MAIN CHAMBER

- Ullage to cylinder ball valve
- Fine control bleeder valve

22310-2 SETA 20% ULLAGE CHAMBER

- Fine control ullage inlet valve

22320-2 SETA 33⅓% ULLAGE CHAMBER

- Fine control ullage inlet valve

Typical Cylinder Assembly
(Gauge and Ullage Chamber supplied separately)

Used to determine the vapour pressure of LPG to avoid exceeding pressure safety limits during storage, handling and use.

PRESSURE CERTIFICATE (UKAS)

ACCESSORIES – Vapour Pressure Cylinders

REQUIRED FOR 22300-2

22490-0	SETA GAUGE ADAPTOR, 1⁄2 inch BSP male to 1⁄4 inch BSP female. For fitting gauge to 22300-2 Main Chamber, pack of 2.
22330-0	SETA CORROSION RESISTANT SAMPLING CONNECTOR, 3ft long, one end suits ullage chamber inlet valve, connects apparatus to sample.

PRESSURE GAUGES

Select from SETA VAPOUR PRESSURE GAUGES below.

OPTIONAL

22090-0	SETA COOLING UNIT, for LPG, with inlet and outlet valves, requires solid CO_2 *(for details see page 118).*

VAPOUR PRESSURE GAUGES

SETA VAPOUR PRESSURE GAUGES

22560-0

ASTM D1267; IP 410; BS 2000 Part 410

- Pressures up to 3500kPa (500psi)
- Accuracy ±1% fsd
- 150mm dial
- Mirror scale in kPa and psi
- ¼ inch BSP fitting
- Sturdy handle

CALIBRATION CERTIFICATE (WORKS)

A range of Bourdon-Tube type pressure gauges with 150mm diameter mirror band dials to eliminate paralax errors while reading. The graduations are marked in kPa and psi (lbf/in²).

The gauges have a bottom entry ¼ inch BSP fitting and a heavy duty stainless steel case with a large carrying handle suitable for lifting a complete pressure vessel assembly from a bath.

The gauges conform to EN 837 S2 (up to 2,500kPa) or S3 (2,500kPa and above), Accuracy Class 1 ±1%fsd.

SETA VAPOUR PRESSURE GAUGES

Seta Part	Scale Range		Division		Sub-Division		Method
	kPa	psi	kPa	psi	kPa	psi	
22550-0	0 to 700	0 to 100	50	10	2	0.5	D1267
22560-0	0 to 1750	0 to 250	100	25	2.5	0.2	D1267
22561-0	0 to 3500	0 to 500	250	50	25	2	D1267
22570-2	0 to 700	n/a	50	n/a	2	n/a	IP 410
22580-2	0 to 2000	n/a	100	n/a	5	n/a	IP 410
22590-2	0 to 3500	n/a	250	n/a	25	n/a	IP 410

international petroleum test methods

energy INSTITUTE

EI correlation and IFIA/EI certification schemes

Participating in EI correlation schemes form a fundamental part of any petroleum laboratory's QA system.

It is a requirement for laboratories accredited to ISO 17025 to participate in interlaboratory comparison or proficiency-testing programmes. Being a member of a recognised scheme provides laboratories with a means to *demonstrate their ability to meet high level standards* to customers on the performance of the laboratory and the integrity of the results generated.

EI Laboratory correlation scheme (EILCS)

The EILCS offers laboratories the opportunity to check their performance on a monthly basis using a variety of commercially available petroleum products forming an important part of any petroleum laboratory's QA procedure.

Laboratories can test up to 3 of the following products per month:

- Gasoline
- Diesel
- Gasoil
- Jet fuel
- Naphtha
- Fuel oil
- Crude oil

Each laboratory receives a monthly and anonymously-coded report that enables laboratories to evaluate their performance at a quick glance.

For further information contact: **e: eilcs@energyinst.org**

IP Gasoline and diesel fuel engine correlation scheme (CFRCS)

Laboratories conducting tests for the assessment of automotive fuel quality must be a member of an inter-laboratory correlation scheme. Membership of the *IP Gasoline and diesel fuel engine correlation scheme* enables laboratories to meet this requirement for both petrol and diesel fuel engines.

Samples of gasoline or reference blends are tested for both research and motor octane number and diesel fuel for cetane number. Results are statistically analysed and published monthly enabling laboratories to compare their results with the statistical mean. In addition, a yearly results report is issued.

For further details of membership, contact **e: cfrcs@energyinst.org**

IP Derived Cetane Number correlation scheme (DCNCS)

This scheme is run parallel to and uses the same specially blended diesel fuels that are used for the *IP Gasoline and diesel fuel engine correlation scheme*. The scheme enables laboratories determining the Derived Cetane Number of diesel fuels by either IP 498 or IP 567 to:

- Compare their results against those determined by other users
- Compare the Derived Cetane Number (DCN) to the mean of that Cetane Number (CN) as determined by IP 41/ASTM D613 in the *IP Gasoline and diesel fuel engine correlation scheme*
- Have a set of secondary working standards with known DCN and CN values that can be used for quality control measurements

For further details of membership, contact **e: dcncs@energyinst.org**

IFIA/EI Petroleum inspector certification programme

As part of the inspection industry's continuous improvement efforts the International Federation of Inspection Agencies (IFIA) has an Inspector certification programme that is operated worldwide. Candidates must demonstrate that they have met the IFIA training requirements and pass an examination, which is valid for a five-year period.

The programme is monitored by a technical advisory board and overseen by the Energy Institute. For further information on examinations (excl. the Americas) please contact IFIA
e: petcomadmin@ifia-federation.org

For further information on examinations held in North and South America please contact IFIA AC: **e: ifianac@aol.com**

IP Standard test methods

international petroleum test methods

IP Standard test methods (STM) is an essential part of any quality control regime for petroleum testing laboratories. A necessary tool for the national and international testing of petroleum and petroleum products, the 2010 version of IP Standard Test Methods also enables laboratories to provide evidence of compliance with the most up to date test methods during inspections. STM can be purchased in book format, as single PDFs or by subscription online.

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D86 DISTILLATION EQUIPMENT

11860-3 SETASTILL

ASTM D86; D216 (obs); D447 (obs); D850; D1078; E133; IP 123; IP 191; IP 195; EN 3405; BS 2000 Parts 123, 191 & 195; BS 658; BS 7392; ISO 198; FTM 791 1001; NF M07-002 (obs); JIS K2254

- Ambient to 400°C distillation range
- Adjustable height heater/flask platform
- Toughened glass window
- Cooling fan

The distillation unit, mounted to the left, comprises a flask support mechanism, heater elements, and the heater controller. The flask is supported by a drop-in ceramic-glass support board mounted to a platform that is adjustable for height.

The quartz enclosed heating elements are attached to the platform, and are powered by a solid-state energy regulator and calibrated control. A cooling fan is installed in the rear of the distillation unit to reduce cooling time between distillations. A toughened glass observation window is fitted in the front of the distillation unit, and a spillage collection tray with outlet is mounted beneath the heaters.

The condenser unit is attached to the distillation unit, and may be used with either a static fill of coolant or a laboratory cooling supply. Housed within the condenser unit is a thermally-insulated, stainless steel coolant tank, fitted with a permanently installed condenser tube. A drain tap and an overflow outlet are mounted on the rear of the unit.

SUPPLIED WITH: mains lead and instruction manual.

CALIBRATION & VERIFICATION MATERIALS

TECHNICAL DATASHEETS AVAILABLE

11860-3 and Accessories

ACCESSORIES – Setastill

REQUIRED

DISTILLATION FLASKS, FLASK STOPPERS, FLASK SUPPORT BOARDS & RECEIVERS:

Refer to tables on page 29.

THERMOMETERS:

ASTM2C/3C/7C/8C/37C/38C/39C/40C/41C/42C/102C/103C/104C/105C/106C/107C or BS 593 (100mm immersion).

IP75C, for condenser (alternative to 11867-0 Digital thermometer).

ASTM38C/IP78C and ASTM40C/IP80C (for BS 658 only).

Note: Other items that may be required include: Petroleum spirit 60/80; Receiver cooling apparatus.b

OPTIONAL

11869-0	D86 DISTILLATION KIT, Groups 1 to 4, comprising: 125ml NS 19/26 Distillation Flask, NS 19/26 Thermometer centering device, Flexible Stopper Caps for side arm (x 5), 100ml Receiver, 38mm Flask Support Board, 50mm Flask Support Board, 50mm, ASTM7C Thermometer, ASTM8C Thermometer, Condenser Cleaning Tool, Boiling Stones.
11865-3	SETA CONDENSER LID, with thermometer support and receiver stand.
11866-0	SETA ANTI-SPLASH PLATE, for 100ml receiver, pack of 3.
11867-0	TEMPEN DIGITAL THERMOMETER, for condenser.
11868-0	HEAT SHIELD, SETASTILL, (ASTM D447 only).
97005-0	SETA-ORBIS DIGISTILL, (*for details see page 30*).
99300-2	MINI LOW TEMPERATURE BATH/CIRCULATOR to provide chilled water for condenser, (*for details see page 139*).
99910-0	PORTABLE DIGITAL BAROMETER, 750 to 1150 mbar absolute, (*for details see page 145*).

CALIBRATION, VERIFICATION & TRAINING

99850-0	MULTI-TEST VERIFICATION MATERIAL, Kerosine (*for details see page 150*).
99851-0	MULTI-TEST VERIFICATION MATERIAL, Gas Oil, (*for details see page 151*).
99854-0	MULTI-TEST VERIFICATION MATERIAL, Motor Gasoline, (*for details see page 151*).
99908-0	BIO MULTI-TEST VERIFICATION MATERIAL, Gas Oil, (*for details see page 151*).

SPECIFICATIONS

Distillation Range:	Ambient to 400°C
Voltage Range:	110/120V or 220/240V, 50/60Hz (switchable)
Power:	1000W maximum
Condenser Volume:	7.2 litre
Size (HxWxD):	47 x 37 x 25cm (Condenser Unit) 47 x 21 x 21cm (Distillation Unit)
Weight:	12kg total

D86 DISTILLATION EQUIPMENT

3

11800-0 SETA DISTILLATION UNIT

ASTM D86; D216 (obs); D447 (obs); D850; D1078; E133; IP 123; IP 191; IP 195; EN 3405; BS 2000, Parts 123, 191 & 195; BS 658; BS 7392; ISO 198; FTM 791 1001; NF M07-002 (obs); JIS K2254

- Suitable for gas or electrical heating
- Toughened glass window
- Front opening door
- Ready drilled for optional electric heater

A distillation unit designed for gas or electric heating. The levelling platform for glass ceramic flask support boards is ready drilled to receive the optional electric heater. Fitted with a toughened glass observation window.

CALIBRATION & VERIFICATION MATERIALS

11800-0 (with 11850-0 installed), 11810-0 and Accessories

11810-0 SETA CONDENSER UNIT

- Straight condenser
- Complements 11800-0 Distillation Unit

A condenser tank fitted with a straight condenser for use with 11800-0 Seta Distillation Unit.

SPECIFICATIONS

Size (HxWxD):	47 x 20 x 20cm (Distillation Unit) 33 x 45 x 19cm (Condenser Unit)
Weight:	6.1kg (Distillation Unit) 5kg (Condenser Unit)

ACCESSORIES – Seta Distillation & Condenser Units

REQUIRED

11850-0 SETAMATIC CONTROLLED HEATER, 1kW, internally mounting, with on-off switch and temperature controller.
Voltage: 110/120V, 50/60Hz
220/240V, 50/60Hz

OR

11805-0 GAS CONTROL VALVE, to regulate gas supply to burner

AND ONE OF THE FOLLOWIING:

10720-0 SETA BURNER, for coal gas.
10740-0 SETA BURNER, for LPG.
10750-0 SETA BURNER, for natural gas.

DISTILLATION FLASKS, FLASK STOPPERS, FLASK SUPPORT BOARDS & RECEIVERS:
Refer to tables on this page.

THERMOMETERS:
ASTM2C/3C/7C/8C/37C/38C/39C/40C/41C/42C/102C/103C/104C/105C/106C/107C or BS 593 (100mm immersion).
ASTM38C/IP78C and ASTM40C/IP80C (for BS 658 only).

Note: Other items which may be required include: Petrolem spirit 60/80; Receiver cooling apparatus.

OPTIONAL

11869-0 D86 DISTILLATION KIT, Groups 1 to 4, comprising: 125ml NS 19/26 Distillation Flask, NS 19/26 Thermometer centering device, Flexible Stopper Caps for side arm (x 5), 100ml Receiver, 38mm Flask Support Board, 50mm Flask Support Board, 50mm, ASTM7C Thermometer, ASTM8C Thermometer, Condenser Cleaning Tool, Boiling Stones.
11866-0 SETA ANTI-SPLASH PLATE, for 100ml receiver, pack of 3.
99910-0 PORTABLE DIGITAL BAROMETER, 750 to 1150 mbar absolute, (*for details see page 145*).

CALIBRATION, VERIFICATION & TRAINING

99850-0 MULTI-TEST VERIFICATION MATERIAL, Kerosine (*for details see page 150*).
99851-0 MULTI-TEST VERIFICATION MATERIAL, Gas Oil, (*for details see page 150*).
99854-0 MULTI-TEST VERIFICATION MATERIAL, Motor Gasoline, (*for details see page 151*).
99908-0 BIO MULTI-TEST VERIFICATION MATERIAL, Gas Oil, (*for details see page 151*).

SETA CERAMIC GLASS FLASK SUPPORT BOARDS

Seta Part	Hole Diameter	Size (W x L)
11808-0	25mm	152 x 152mm
11809-0	32mm	152 x 152mm
11811-0	38mm	152 x 152mm
11812-0	50mm	152 x 152mm
11813-0	70mm	152 x 152mm

DISTILLATION FLASK ACCESSORIES

Seta Part	Description
11804-0	FLEXIBLE STOPPER CAP, for side arm, pack of 10
11806-0	THERMOMETER CENTRING DEVICE, for straight neck flask
11807-0	THERMOMETER CENTRING DEVICE, for NS type flask
11814-0	CORK, for 11890-0 & 11940-0, pack of 100
11815-0	CORK, for side arm, pack of 100
11869-002	BOILING STONES, pack of 3

DISTILLATION FLASKS

Seta Part	Volume	Description
11950-0	100ml	Pack of 5
11940-0	125ml	NS type, pack of 5
11890-0	125ml	Straight neck, pack of 5
11960-0	200ml	E133, pack of 5
11962-0	200ml	D850, pack of 5
11970-0	250ml	Pack of 5

RECEIVERS

Seta Part	Volume	Form	Notes
22159-0	25ml	Parallel	Pack of 3
22160-0	100ml	Parallel	Pack of 3
22161-0	200ml	Parallel	Pack of 3
11910-004	100ml	Crow Type	Pack of 2

ORBIS BV PAM DISTILLATION UNIT

PRECISION AUTOMATED MANUAL DISTILLATION UNIT

ASTM D86; D850; D1078; E123; IP 123; IP 191; IP 195; EN 3405; BS 2000 Parts 123, 191 &195; BS 7392; ISO 918; ISO 3405; DIN 51 751; NF M07-002; JIS K2254

- Fully automated operation
- True volume measurement - no correction factoring
- Programmable with 'learn' feature
- Temperature probes with built-in calibration data
- Dynamic ASTM 7C/F and ASTM 8C/F thermometer simulation
- Final boiling point detection and loss correction
- Dry point determination
- Automatic barometric pressure correction
- Independant temperature control of distillation flask, condenser and receiver
- No refrigerants or liquid coolants
- Peltier cell cooled "Solid State" condenser module
- Peltier cell cooled receiver compartment
- Stand-alone or PC operated
- RS232, RS485 and printer ports, LIMS compatible
- LIMS compatible
- Software available for data logging and instrument control

A programmable, fully automated, self contained distillation unit designed and manufactured by Orbis BV, featuring the unique liquid/refrigerant free "Solid State" condenser and cooled receiver compartment.

Distillation programs, comprising temperature/time profiles and volume setpoints, can be downloaded from a personal computer or entered via the control panel. Up to 10 programs can be stored in the on-board memory, and can be modified whilst using the 'Learn' facility.

The unit continually measures the temperature of vapour in the distillation flask, the volume of distillate in the receiver, and the time interval. Whenever a setpoint is reached these parameters are recorded. The readings are corrected automatically from data supplied by the integral precision electronic barometer. The results memory can hold up to 28 datasets of 100 volume setpoints.

To ensure conformity to ASTM D86, the temperature in the flask is measured by a digital system that incorporates dynamic simulation models of ASTM 7C/F and 8C/F mercury-in-glass thermometers. The probe carries an embedded calibration curve. Re-calibration can be carried out by the user via the distillation unit.

AUTOMATIC DATA COLLECTION

97005-0 SETA-ORBIS DIGISTILL^{D86} THERMOMETER AND DATA PROCESSOR

ASTM D86; D850; D1078; E123; IP 123; IP 191; IP 195; EN 3405; BS 2000 Parts 123, 191 &195; BS 7392; ISO 918; ISO 3405; DIN 51 751; NF M07-002; JIS K2254

- Equivalent to ASTM 7C/F or 8C/F thermometers
- 28 x 100 reading memory
- Selectable barometric correction mode
- Remote button
- Final boiling point detection and loss correction
- Absolute or simulated ASTM temperatures
- Automatic temperature probe calibration
- Pressure calibration facility
- RS232, RS485 and printer ports

CALIBRATION CERTIFICATE (WORKS)
OPTIONAL: CALIBRATION CERTIFICATE (UKAS)

97005-0

DISTILLATION FLASK HEATERS

Typical Dean & Stark Assembly

ASTM D95; D244; D4006; E123; IP 74; IP 291; IP 358; BS 2000 Parts 74 & 358; BS 756; ISO 3733; ISO 9029; API 2560; API MPMS Chapter 10.2; API MPMS Chapter 10.5; FTM 791 3001 (obs); NF T60-113; JIS K2275

SPECIFICATIONS

Seta Part No:	24410-4	24415-2	24530-4	24540-4
Suitable Flask Size:	500ml	1000ml	500ml	500ml
Number of Heater Stations:	1	1	3	6
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz	110/120V, 50/60Hz 220/240V, 50/60Hz	110/120V, 50/60Hz 220/240V, 50/60Hz	110/120V, 50/60Hz 220/240V, 50/60Hz
Power:	200W	200W	600W	1200W
Size (HxWxD):	15 x 30 x 46cm	15 x 30 x 46cm	15 x 80 x 46cm	15 x 100 x 46cm
Weight:	3.5kg	3.5kg	10kg	12kg

STANDS & FITTINGS, CONDENSERS & DISTILLATION FLASKS

Seta Part No.	Name
24500-0	SETA STEEL STAND, 23 x 14cm base with a 12.7mm diameter steel rod 76cm high, suitable for use with 24410-4 and 24415-2 Distillation Flask Heaters.
24520-0	CLAMP, for holding glassware, three fingered padded jaw to protect and grip glassware, fully open capacity 90mm.
24650-2	BOSSHEAD, for attaching 24520-0 Clamp to 24500-0 Stand.
24440-0	CONDENSER, Reflux type, 40cm effective length, B19 Cone.
24445-0	DRYING TOWER & STOPPER
24401-0	DISTILLATION FLASK, 500ml, B24 Cone.
24402-0	DISTILLATION FLASK 1000ml, B24 Cone.

RECEIVERS

Seta Part No.	Name	Trap Size	Graduation Division	Range	Description End	Condenser Joint	Distillation Flask Joint	Methods
24450-0	RECEIVER	2.0ml	0.05ml	0.1 to 2.0ml	Round	B19 Cone	B24 Cone	
24460-0	RECEIVER	3.0ml	0.05ml	0 to 3.0ml	Round	B19 Cone	B24 Cone	
24465-0	RECEIVER	5.0ml	0.05ml	0 to 5.0ml	Round	B19 Cone	B24 Cone	
24470-0	RECEIVER	7.5ml	0.1ml	0.5 to 7.5ml	Round	B19 Cone	B24 Cone	
24480-0	RECEIVER	10.0ml	0.1ml	1 to 10ml	Round c/w Stopcock	B19 Cone	B24 Cone	
24490-0	RECEIVER	12.5ml	0.1ml	0 to 12.5ml	Round	B19 Cone	B24 Cone	
24495-0	RECEIVER	25.0ml	0.2ml	5 to 25ml	Conical	B19 Cone	B24 Cone	BS756
24497-0	RECEIVER	25.0ml			Conical	B19 Cone	B24 Cone	IP 74
24510-0	RECEIVER	25.0ml	0.1ml	6 to 25ml	Round	B19 Cone	B24 Cone	IP 291

ASPHALT DISTILLATION

11900-0 SETA ASPHALT DISTILLATION APPARATUS

ASTM D402-IP 27; BS 2000 Part 27; NF T66-003 (obs); AASHTO T78 (obs)

- Gas heated
- Stand mounting

Apparatus for measuring the volume of volatile constituents in cutback asphaltic products. Comprises a heat insulated shield, two-part insulated cover, and two sheets of 16 mesh gauze, supported on a height adjustable platform. A steel chimney below the shield reduces heat loss from the gas burner (not supplied). Stand mounting.

ACCESSORIES – Asphalt Distillation

REQUIRED

11910-0	GLASSWARE, comprises 500ml side-arm distillation flask, glass-jacketed standard condenser, adaptor spout and 100ml Crow receiver.
11920-0	RESIDUE CONTAINER, 8oz, with slip-on cover, pack of 5.
24500-0	SETA STEEL STAND, for mounting apparatus (two required).
24520-0	CLAMP, to secure condenser to bosshead.
24650-2	BOSSHEAD, to secure clamp to stand.

AND ONE OF THE FOLLOWIING:

13401-0	SETA BURNER, for natural gas (methane).
13402-0	SETA BURNER, for LPG.
13403-0	SETA BURNER, for coal gas.

THERMOMETERS:

ASTM8C/IP6C or ASTM8F

11900-0 and Accessories

11900-0 (Burner, glassware and stands supplied separately)

SPECIFICATIONS

Size (HxWxD):	30 x 100 x 20cm
Weight:	1.6kg

CONSUMABLES – Asphalt Distillation

2 Years/2000 Tests		Qty
11910-001	DISTILLATION FLASK, pack of 2	2
11910-004	RECEIVER, CROW TYPE, pack of 2	1

SETAVIS AUTOMATIC KINEMATIC VISCOMETER

83545-3 SETAVIS 'DOUBLE 6' KINEMATIC AUTO-VISCOMETER

ASTM D7279 Houillon Method

Correlates with: ASTM D445; D446; D2270; IP 71; IP 226; BS 188; BS 2000 Part 71; BS 4459; EN 3104; ISO 2909; ISO 3104; FTM 791 305; NF T60-100; NF T60-136; JIS K2283

- Two independently controlled baths
- Up to 6 viscometer tubes per bath
- Micro samples
- Two tests per tube from a single sample
- Automatic tube cleaning and drying
- Control and data analysis software

The Setavis Double 6 KAV is a compact bench top, automatic kinematic viscometer, equipped with two baths that each accept up to six kinematic viscometer tubes. Applications include research, process, and batch control. Suitable for testing both transparent and opaque samples over a wide range of products, including lubricants, transformer oils, and used oils.

Rapid test times and high sample throughput are achieved by using Setavis Auto Duplex tubes, which have two measurement zones, doubling the number of results per test. The baths will also accept manual Houillon type viscometer tubes.

Precision optical detectors eliminate timing errors due to operator reaction time and parrallax errors. The fully automatic cleaning/drying reduces the downtime between sample injections.

SUPPLIED WITH: Setavis KAV software, one 6 way Autoclean module, tubing, connecting and mains leads and instruction manual.

Note: Supplied without viscometer tubes or thermometers, refer to the accessories section. This equipment requires to be connected to a computer, vacuum source and solvent containers.

83545-3 with additional 83575-2 and Viscometer Tubes (supplied separately)

DUAL BATHS

The baths are independently temperature controlled within a range of ambient to 150°C, allowing one bath to be set at 40° and the other at 100°C. Each bath comprises a heater coil, stirrer unit, and a cooling coil for temperatures near ambient, ensuring even temperature distribution. Up to six viscometer tubes can be installed in each bath.

FAST FLOW TIMES

Flow times are typically between 50 to 100 seconds. The sample flows into the measuring section of the viscometer tube via a temperature equilibrium zone.

HIGH SAMPLE THROUGHPUT

An average test, including cleaning, can be completed in less than 15 minutes, allowing a maximum of 24 samples per bath (48 separate test results) per hour. With 12 positions fully utilised, typically 96 test results can be achieved per hour.

ENCLOSED AUTOMATIC CLEANING

The Autoclean module can clean up to six viscometer tubes automatically. After the sample is detected leaving the measuring section, the tube is flushed with solvent and dried by air in preparation for the next sample. Solvent usage is typically 10 to 20ml per test. The Autoclean module can be connected to 2 alternative solvent supplies allowing samples with different compositions to be tested in the same tube. The cleaning capacity can be expanded to 12 way with an optional kit (83575-2).

MICRO SAMPLES

The viscometer tubes only require a very small sample size (micro samples), typically 0.25ml. The sample volume required is dependent on the tube constant and is pre-determined at the time of tube manufacture. For maximum accuracy and ease of handling, it is recommended that samples are injected into the capillary using a positive displacement pipette.

BIO-FUEL TESTING

SOFTWARE INCLUDED

CALIBRATION & VERIFICATION MATERIALS

SETAPLUS EXTENDED WARRANTY AVAILABLE

TECHNICAL DATASHEETS AVAILABLE

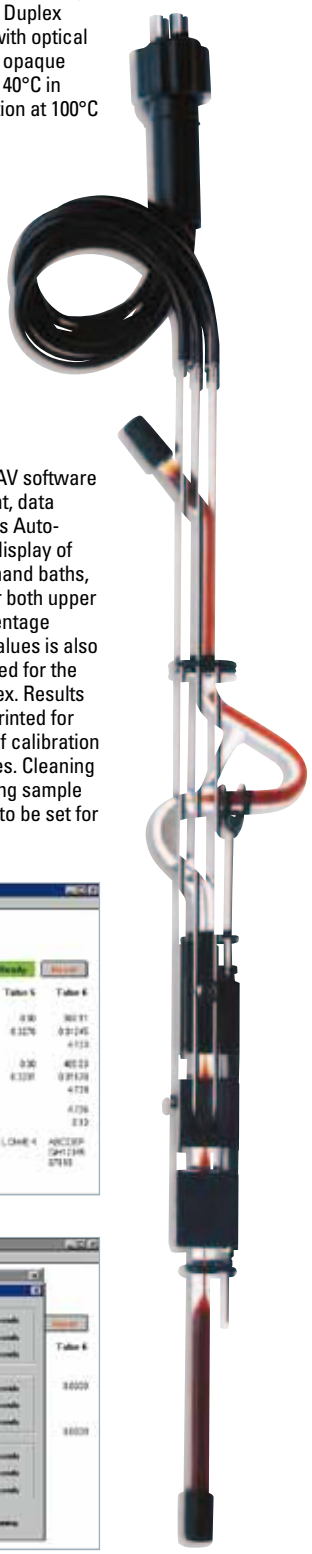
SPECIFICATIONS

Viscosity Range:	2.5 to 2000 mm^2/s
Temperature Range:	Ambient to 150°C
Temperature Stability:	±0.01° below 100°C ±0.03° 100 to 150°C
Sample Size:	0.15 to 0.275 ml
Typical Flow Time:	50 to 100 seconds
No of Baths:	2
Bath Capacity:	2 litres
Tube Capacity:	up to 12 (6 per bath)
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz (switchable)
Power:	800W
Size (HxWxD):	68 x 59 x 37cm
Weight:	40kg

SETAVIS AUTOMATIC KINEMATIC VISCOMETER

AUTO-DUPLEX VISCOMETER TUBES

Each tube has two measuring bulbs (upper and lower) in series, providing two measurements from a single sample injection. This increases the overall capacity of the instrument to 24 simultaneous tests, and provides a quick check of determinability. 7 tubes are available covering the range 2.5 to 2000 mm²/s. Seta Auto Duplex Viscometer Tubes are supplied fitted with optical detectors suitable for transparent and opaque samples, and are factory calibrated at 40°C in accordance with ASTM D446 (calibration at 100°C available on request).



SETAVIS SOFTWARE

The Windows™ compatible Setavis KAV software allows simultaneous tube management, data logging and analysis of up to 12 Setavis Auto-Duplex viscometer tubes. A real time display of flow times is provided for left or right hand baths, with kinematic viscosity calculated for both upper and lower measuring bulbs. The percentage mean difference of upper and lower values is also displayed. An integral facility is provided for the automatic calculation of Viscosity Index. Results and sample numbers are stored and printed for individual tubes. Each tube has a log of calibration constants for both 40° and 100°C values. Cleaning cycles are user programmable, allowing sample extraction, cleaning, and drying times to be set for each individual tube.

ACCESSORIES – Setavis 'Double 6' Kinematic Auto-Vis.

REQUIRED

SETAVIS KAV AUTO DUPLEX TUBES.

Complete with auto-detection sensor head and leads. The range covers 2.5 to 2000mm²/s. Calibration is based on a minimum flow time of 50 seconds at 40°C.

CALIBRATION CERTIFICATE (WORKS)

Seta Part No.	Nominal Constant	Sample Volume (ml)	Viscosity Range (mm²/s)
83605-003	0.05	0.15	2.5 to 30
83605-004	0.1	0.175	5 to 60
83605-005	0.3	0.175	15 to 180
83605-006	0.5	0.225	25 to 300
83605-007	1.0	0.250	50 to 600
83605-008	3.0	0.250	150 to 1200
83605-009	5.0	0.275	250 to 2000

SETA KINEMATIC VISCOSITY BATH THERMOMETERS.

With ice point scale and 0.02°C subdivisions to allow easy reading to within 0.01°C.

CALIBRATION CERTIFICATE (WORKS)

CALIBRATION CERTIFICATE (UKAS) - OPTIONAL

Seta Part No. Works Certificate	Seta Part No. UKAS Certificate	Temperature Set Point (°C)	Temperature Range (°C)
83620-0	83620-0Z	40	38.6 to 41.4
83622-0	83622-0Z	50	48.6 to 51.4
83624-0	83624-0Z	100	98.6 to 101.4
83626-0	83626-0Z	150	148.6 to 151.4

83747-2 DIGITAL PIPETTE, 50 to 250µl, for transparent or opaque liquids.

83748-2 PIPETTE TIPS, disposable, pack of 200.

94630-0 BATH OIL, 5 litres, for filling viscometer baths in the temperature range of ambient to 80°C. 1 per bath.

AND/OR

94634-0 BATH OIL, 5 litres, for filling viscometer baths in the temperature range of 80 to 120°C. 1 per bath.

AND/OR

94631-0 SILICONE BATH OIL, 2 litres, for filling viscometer baths in the temperature range of 100 to150°C, (3 required per bath).

OPTIONAL

83570-0 SETA BACK-FLUSH KIT, for cleaning blocked tubes in situ. Comprises wash bottle and tubing.

83575-2 6-WAY AUTOCLEAN FITTING KIT, extends the automatic cleaning function to cover up to 12 tubes.

83582-2 SETAVIS SOLVENT CONTAINER, (1 required for each solvent type).

83578-2 WASTE EXTRACTION SYSTEM, two stage diaphragm vacuum pump and 2 waste containers. Suitable for cleaning up to 12 tubes mounted in two baths.

83700-5 SETA UNIVERSAL PRE-HEATING AND FILTERING KIT, for use with transparent and opaque samples. Comprises hot plate, support, high temperature 75 micron reusable filter unit and 100 low temperature disposable sample containers with 100 associated 75 micron filters and covers.

99300-2 MINI LOW TEMPERATURE BATH/CIRCULATOR, to provide chilled water if local supply exceeds 18°C, *(for details see page 139).*

45002-0 SETAPLUS EXTENDED 12 MONTH WARRANTY

CALIBRATION, VERIFICATION & TRAINING

VISCOSITY STANDARDS *(for details see page 48).*

99928-0 SETATHERM, precision logging digital thermometer optimised for verification of viscosity baths, *(for details see page 129).*

Note: Other items which may be required include: Solvents for tube cleaning.

CONSUMABLES – Setavis 'Double 6' Kinematic Auto-Vis.

2 Years/2000 Tests	Qty
22420-005 'O' RING PIPE SEAL. pack of 10	2

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SETAVIS MANUAL KINEMATIC VISCOMETERS

83542-0 SETAVIS 'DOUBLE 6' KINEMATIC VISCOMETER

ASTM D7279 Houillon Method

Correlates with: ASTM D445; D446; D2270; IP 71; IP 226; BS 188; BS 2000 Part 71; BS 4459; EN 3104; ISO 2909; ISO 3104; FTM 791 305; NF T60-100; NF T60-136; JIS K2283

- Two independently controlled baths
- Temperature range 0 to 150°C
- Up to 6 viscometer tubes per bath
- Integral 6 channel digital timer
- In-situ tube cleaning with integral vacuum pump

The 83542-0 is a manual version of the 83545-3 automatic kinematic viscometer. The instrument is a bench top stand alone instrument comprising two temperature controlled baths, each providing capacity for up to six Setavis viscometer tubes, and an integral 6-channel timer.

An internal vacuum pump and collector assist in cleaning and drying the viscometer tubes while still installed in the equipment.

SUPPLIED WITH: mains lead and instruction manual.

Notes: Supplied without viscometer tubes or thermometers, refer to the accessories section.

BIO-FUEL TESTING

CALIBRATION & VERIFICATION MATERIALS

SETAPLUS EXTENDED WARRANTY AVAILABLE

TECHNICAL DATASHEETS AVAILABLE

83542-0 (Viscometer tubes supplied separately)

83541-3 SETAVIS KINEMATIC VISCOMETER

ASTM D7279 Houillon Method

Correlates with: ASTM D445; D446; D2270; IP 71; IP 226; BS 188; BS 2000 Part 71; BS 4459; EN 3104; ISO 2909; ISO 3104; FTM 791 305; NF T60-100; NF T60-136; JIS K2283

- Temperature range 0 to 150°C
- Up to 6 viscometer tubes
- Integral 6 channel digital timer
- In-situ tube cleaning with integral vacuum pump

The 83541-3 is a compact version of the 83542-0 kinematic viscometer, with one temperature controlled bath providing capacity for six Setavis viscometer tubes and six simultaneous measurements. Complete with integral 6-channel timer and vacuum pump for in-situ cleaning.

SUPPLIED WITH: mains lead and instruction manual.

BIO-FUEL TESTING

CALIBRATION & VERIFICATION MATERIALS

SETAPLUS EXTENDED WARRANTY AVAILABLE

TECHNICAL DATASHEETS AVAILABLE

83541-3 (Viscometer tubes supplied separately)

SETAVIS MANUAL KINEMATIC VISCOMETERS

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ACCESSORIES – Setavis Kinematic Viscometer

REQUIRED

83600-0 SETA KINEMATIC VISCOMETER TUBES, set of nine, range 3 to 2000mm²/s. Calibration based on a minimum flow time of 200 seconds at 40°C.

CALIBRATION CERTIFICATE (WORKS)

Note: If a full set is not required, individual tubes are available as follows.

Seta Part No.	Nominal Constant	Sample Volume (ml)	Viscosity Range (mm²/s)
83600-001	0.01	0.1	3 to 9
83600-002	0.03	0.15	6 to 18
83600-003	0.05	0.15	10 to 30
83600-004	0.1	0.175	20 to 60
83600-005	0.3	0.175	60 to 180
83600-006	0.5	0.225	100 to 300
83600-007	1.0	0.250	200 to 600
83600-008	3.0	0.250	600 to 1200
83600-009	5.0	0.275	1000 to 2000

SETA KINEMATIC VISCOSITY BATH THERMOMETERS.

With ice point scale and 0.02°C subdivisions to allow easy reading to within 0.01°C.

CALIBRATION CERTIFICATE (WORKS)

CALIBRATION CERTIFICATE (UKAS) - OPTIONAL

Seta Part No. Works Cert.	Seta Part No. UKAS Cert.	Temperature Set Point (°C)	Temperature Range (°C)
83620-0	83620-0Z	40	38.6 to 41.4
83622-0	83622-0Z	50	48.6 to 51.4
83624-0	83624-0Z	100	98.6 to 101.4
83626-0	83626-0Z	150	148.6 to 151.4

83747-2 DIGITAL PIPETTE, 50 to 250µL for transparent or opaque liquids.

83748-2 PIPETTE TIPS, disposable, pack of 200.

94630-0 BATH OIL, 5 litres, for filling viscometer baths in the temperature range of ambient to 80°C.

AND/OR

94634-0 BATH OIL, 5 litres, for filling viscometer baths in the temperature range of 80 to 120°C.

AND/OR

94631-0 SILICONE BATH OIL, 2 litres, for filling viscometer baths in the temperature range of 100 to 150°C.

REQUIRED - Bitumen Tests Only

83602-0 SETA BITUMEN KINEMATIC VISCOMETER TUBES. Set of six covering 6 to 1800mm²/s. Calibration based on a minimum flow time of 200 seconds at 37.8°C.

CALIBRATION CERTIFICATE (WORKS)

Note: If a full set is not required, individual tubes are available as follows.

Seta Part No.	Nominal Constant	Sample Volume (ml)	Viscosity Range (mm²/s)
83602-001	0.1	0.3	6 to 60
83602-002	0.3	0.3	18 to 180
83602-003	1	0.4	60 to 600
83602-004	3	0.5	180 to 1800
83602-005	10	0.5	600 to 6000
83602-006	30	0.5	1800 to 18000

83630-0 BITUMEN ACCESSORY KIT, adaptor plate to accept bitumen viscometer tubes and thermometers.

83710-0 HYPODERMIC SYRINGE, for bitumen sample, pack of 10.

SETA KINEMATIC VISCOSITY BATH THERMOMETERS FOR BITUMEN TESTS.

With ice point scale and 0.02°C subdivisions allow easy reading to within 0.01°C, accuracy better than ±1 subdivision.

CALIBRATION CERTIFICATE (WORKS)

CALIBRATION CERTIFICATE (UKAS) - OPTIONAL

Seta Part No. Works Cert.	Seta Part No. UKAS Cert.	Temperature Set Point (°C)	Temperature Range (°C)
83631-0	83631-0Z	60	58.6 to 61.4
83633-0	83633-0Z	135	133.6 to 136.4

ACCESSORIES – Continued

OPTIONAL

83570-0 SETA BACK-FLUSH KIT, for cleaning blocked tubes in situ. Comprises wash bottle and tubing.

83700-5 SETA UNIVERSAL PRE-HEATING AND FILTERING KIT, for use with transparent and opaque samples. Comprises hot plate, support, high temperature 75 micron reusable filter unit and 100 low temperature disposable sample containers with 100 associated 75 micron filters and covers.

99300-2 MINI LOW TEMPERATURE BATH/CIRCULATOR, to provide chilled water if local supply exceeds 18°C, (*for details see page 139*).

45002-0 SETAPLUS EXTENDED 12 MONTH WARRANTY

CALIBRATION, VERIFICATION & TRAINING

VISCOSITY STANDARDS, *(for details see page 48).*

99928-0 SETATHERM, precision logging digital thermometer optimised for verification of viscosity baths, (*for details see page 129).*

Note: Other items which may be required include: Solvents for tube cleaning.

CONSUMABLES – Setavis Kinematic Viscometer

2 Years/2000 Tests		Qty
22420-005	'O' RING PIPE SEAL, pack of 10	2
83541-302	TUBE DUST COVER, pack of 24	12
83541-306	VITON TUBING, 1 metre	1

SPECIFICATIONS

Seat Part No:	83542-0	83541-3
Viscosity Range:	2.5 to 2000 mm²/s	2.5 to 2000 mm²/s
Temperature Range:	Ambient to 150°C	Ambient to 150°C
Temperature Stability:	±0.01° below 100°C ±0.03° 100 to 150°C	±0.01° below 100°C ±0.03° 100 to 150°C
Sample Size:	0.15 to 0.275 ml	0.15 to 0.275 ml
Typical Flow Time:	50 to 100 seconds	50 to 100 seconds
No. of Timer Channels:	6	6
No. of Baths:	2	1
Bath Capacity:	2 litres	2 litres
Tube Capacity:	up to 12 (6 per bath)	up to 6
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz (switchable)	110/120V, 50/60Hz 220/240V, 50/60Hz (switchable)
Power:	800W	450W
Size (HxWxD):	68 x 59 x 30cm	60 x 40 x 30cm
Weight:	37kg	22kg

KINEMATIC VISCOMETER BATHS

84000-0 SETA KV-8 VISCOMETER BATH

ASTM D445; D446; D2170; D2270; IP 71; IP 226; IP 319; BS 188; BS 2000 Parts 71 & 319; EN 3104; EN 12595; ISO 3105; DIN 51 366; DIN 51 562; FTM 791 305; NF T60-100; NF T60-136; JIS K2283

- Up to 8 viscometer tubes
- 50 litre oil bath
- Temperature range ambient to 150°C
- Precision temperature trim control
- Toughened glass front panel
- Optional diffused backlight

The Seta KV-8 has a 50 litre temperature controlled oil bath that can accommodate up to eight standard viscometer tubes. Digital temperature control and an inbuilt cold water cooling coil provide accurate and stable test temperatures from ambient to 150°C (±0.01°C below 100°C and ±0.03°C at 150°C). The bath is protected by low liquid level and overtemperature cut-outs.

Equipped with a toughened glass front window, easily accessible drain valve, levelling feet, and with provision for fitting diffused back lighting, top plate, and attachments.

SUPPLIED WITH: mains lead and instruction manual.

84000-0 (Viscometer tubes, holders, top plate and thermometer supplied separately)

BIO-FUEL TESTING

CALIBRATION & VERIFICATION MATERIALS

SETAPLUS EXTENDED WARRANTY AVAILABLE

TECHNICAL DATASHEETS AVAILABLE

SPECIFICATIONS

Temperature Range:	Ambient to 150°C
Temperature Stability:	±0.01° up to 100°C ±0.03° at 150°C
Temperature Uniformity:	±0.01° at 40 and 100°C
Tube Capacity:	up to 8
Bath Fluid:	Oil
Bath Capacity:	50 Litres
Voltage:	220/240V, 50/60Hz
Power:	3.1kW
Size (HxWxD):	60 x 79 x 35cm
Weight:	44kg

CONSUMABLES - KV 8 Bath

2 Years/2000 Tests		Qty
84004-0	SEALING CAPS	8

ACCESSORIES - KV 8 Bath

REQUIRED

KINEMATIC VISCOMETER TUBES:
Select from the tables on pages 40 to 42

SETA KINEMATIC VISCOSITY BATH THERMOMETERS.
With ice point scale and 0.02°C subdivisions to allow easy reading to within 0.01°C.

CALIBRATION CERTIFICATE (WORKS)

CALIBRATION CERTIFICATE (UKAS) - OPTIONAL

Seta Part No. Works Cert.	Seta Part No. UKAS Cert.	Temperature Set Point (°C)	Temperature Range (°C)
83640-0	83640-0Z	40	38.6 to 41.4
83641-0	83641-0Z	100	48.6 to 51.4

23150-2	UNIVERSAL VISCOMETER HOLDER, for all regular viscometer tubes, 8 required.
84002-0	TOP PLATE KV8, with levelling screws for each position, accepts eight viscometer tube holders and two thermometers,
84006-0	UNIVERSAL THERMOMETER HOLDER, 2 required.
94633-0	BATH OIL, 20 litres, for filling viscometer baths in the temperature range of ambient to 80°C, 3 required.
	OR
94635-0	BATH OIL, 20 litres, for filling viscometer baths in the temperature range of 80 to 120°C, 3 required.
	OR
94632-0	SILICONE BATH OIL, 20 litres, for filling viscometer baths in the temperature range of 100 to 150°C, 3 required.

ACCESSORIES - Continued

OPTIONAL

23152-0	VISCOMETER HOLDER, 11mm tube size, for Ubbelholde & suspended level viscometers.
23154-0	VISCOMETER HOLDER, 13mm tube size, for Cannon Fenske viscometers.
23156-0	VISCOMETER HOLDER, 15mm tube size, for U-tube reverse flow viscometers.
83750-3	SETATIME SIX CHANNEL QUARTZ TIMER, for time measurement to 999.99 seconds, accuracy 99.999% ±1 digit at 20°C, (*for details see page 141*).
84001-0	DIFFUSED LIGHTING UNIT, fits to rear of bath to backlight the tubes.
84003-0	COVERS, for unused holders in lid to minimise heat loss, pack of 2, 4 packs required.
84004-0	CAPS, for sealing space around viscometer limbs. Can be modified to suit all viscometer tubes, 8 required.
84005-0	SPIRIT LEVEL
84008-0	BENCH VISCOMETER STAND, framework holds viscometer tubes near vertical while being prepared or while draining after use, complete with drainage tray.
84102-0	DENSITY MEASURING KIT, adapter to allow use of glass hydrometers. For tests at 15°C the 99300-2 bath is required (*for details see below*).
99300-2	MINI LOW TEMPERATURE BATH/CIRCULATOR, to provide chilled water if local supply exceeds 18°C, (*for details see page 139*).
97100-0	VISCOMETER TUBE CLEANER, (*for details see page 39*).
45001-0	SETAPLUS EXTENDED 12 MONTH WARRANTY

CALIBRATION, VERIFICATION & TRAINING

VISCOSITY STANDARDS, *(for details see page 48).*

99928-0	SETATHERM, precision logging digital thermometer optimised for verification of viscosity baths, (*for details see page 129*).

Note: Other items which may be required include: Solvents for tube cleaning.

KINEMATIC VISCOMETER BATHS

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84200-0 SETA KV-6 VISCOMETER BATH

ASTM D445; D446; D2170; D2270; IP 71; IP 226; IP 319; BS 188; BS 2000 Parts 71 & 319; EN 3104; EN 12595; ISO 3105; DIN 51 366; DIN 51 562; FTM 791 305; NF T60-100; NF T60-136; JIS K2283

- Up to 6 viscometer tubes
- 50 litre oil/water bath
- Temperature range ambient to 150°C
- Digital display with 0.01°C resolution
- Toughened glass front panel
- Integral back lighting

The Seta KV-6 has a 50 litre temperature controlled bath that can accommodate up to six standard viscometer tubes. Digital temperature control and an inbuilt cold water cooling coil provide accurate and stable test temperatures from ambient to 150°C (±0.02°C up to100°C and ±0.05°C between 100 and 150°C). The bath is protected by low liquid level and overtemperature cut-outs.

Equipped with a toughened glass front window, easily accessible drain valve, integral back lighting, top plate, provision for reference thermometer and attachments.

SUPPLIED WITH: mains lead and instruction manual.

84200-0

BIO-FUEL TESTING

CALIBRATION & VERIFICATION MATERIALS

SETAPLUS EXTENDED WARRANTY AVAILABLE

TECHNICAL DATASHEETS AVAILABLE

SPECIFICATIONS

Temperature Range:	Ambient to 150°C
Temperature Stability:	±0.02° up to 100°C ±0.05° between 100 and 150°C
Temperature Uniformity:	±0.02° at 40 and 100°C
Tube Capacity:	up to 6
Bath Fluid:	Oil or Water
Bath Capacity:	50 Litres
Voltage:	220/240V, 50/60Hz
Power:	2.2kW
Size (HxWxD):	56 x 35 x 44cm
Weight:	33kg

CONSUMABLES – KV 6 Bath

2 Years/2000 Tests		Qty
84004-0	SEALING CAPS	6

ACCESSORIES – KV 6 Bath

REQUIRED

KINEMATIC VISCOMETER TUBES:
Select from the tables on pages 40 to 42

SETA KINEMATIC VISCOSITY BATH THERMOMETERS.
With ice point scale and 0.02°C subdivisions to allow easy reading to within 0.01°C.

CALIBRATION CERTIFICATE (WORKS)

CALIBRATION CERTIFICATE (UKAS) - OPTIONAL

Seta Part No. Works Cert.	Seta Part No. UKAS Cert.	Temperature Set Point (°C)	Temperature Range (°C)
83640-0	83640-0Z	40	38.6 to 41.4
83641-0	83641-0Z	100	48.6 to 51.4

23150-2	UNIVERSAL VISCOMETER HOLDER, for all regular viscometer tubes, 6 required.
84006-0	UNIVERSAL THERMOMETER HOLDER, 2 required.
94633-0	BATH OIL, 20 litres, for filling viscometer baths in the temperature range of ambient to 80°C, 3 required.
	OR
94635-0	BATH OIL, 20 litres, for filling viscometer baths in the temperature range of 80 to 120°C, 3 required.
	OR
94632-0	SILICONE BATH OIL, 20 litres, for filling viscometer baths in the temperature range of 100 to 150°C, 3 required.

ACCESSORIES – Continued

OPTIONAL

23152-0	VISCOMETER HOLDER, 11mm tube size, for Ubbelholde & suspended level viscometers.
23154-0	VISCOMETER HOLDER, 13mm tube size, for Cannon Fenske viscometers.
23156-0	VISCOMETER HOLDER, 15mm tube size, for U-tube reverse flow viscometers.
83750-3	SETATIME SIX CHANNEL QUARTZ TIMER, for time measurement to 999.99 seconds, accuracy 99.999% ±1 digit at 20°C, (*for details see page 141*).
84003-0	COVERS, for unused holders in lid to minimise heat loss, pack of 2.
84004-0	CAPS, for sealing space around viscometer limbs. Can be modified to suit all viscometer tubes, 6 required.
84005-0	SPIRIT LEVEL
84008-0	BENCH VISCOMETER STAND, framework holds viscometer tubes near vertical while being prepared or while draining after use, complete with drainage tray.
84102-0	DENSITY MEASURING KIT, adapter to allow use of glass hydrometers. For tests at 15°C the 99300-2 bath is required (*for details see below*).
99300-2	MINI LOW TEMPERATURE BATH/CIRCULATOR, to provide chilled water if local supply exceeds 18°C, (*for details see page 139*).
97100-0	VISCOMETER TUBE CLEANER, (*for details see page 39*).
45001-0	SETAPLUS EXTENDED 12 MONTH WARRANTY

CALIBRATION, VERIFICATION & TRAINING

VISCOSITY STANDARDS, *(for details see page 48).*

99928-0	SETATHERM, precision logging digital thermometer optimised for verification of viscosity baths, (*for details see page 129*).

Note: Other items which may be required include: Solvents for tube cleaning.

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LOW TEMPERATURE KINEMATIC VISCOMETER BATHS

94710-2 KV-2 LOW TEMPERATURE VISCOMETER BATH

ASTM D445; D446; IP 71; BS 188; BS 2000 Part 71; ISO 3104; ISO 3105; DIN 51 561; NF T60-100; FTM 791 305; JIS K2283

- Temperature range -40°C to +20°C
- High stability - ±0.015 @-20°C, ±0.01 @-40°C
- Accommodates up to 2 standard viscometer tubes
- Backlighting
- Insulated viewing window

A compact low temperature high stability kinematic viscometer bath with integral refrigeration that can accommodate up to 2 viscometer tubes.

The refrigeration system gives the stirred bath a temperature range of 20 down to -40°C, stable to within ±0.015 @-20°C. A twin display shows the current and set temperature. Temperature is measured by a PT100 probe. The bath has independent over-temperature and low fluid level cut-outs and a warning alarm.

The insulated bath is sealed by 8mm thick glass front and rear with 60mm plexiglass providing additional insulation. The bath is illuminated via integral diffuse back lighting.

SUPPLIED WITH: mains lead and instruction manual.

BIO-FUEL TESTING

CALIBRATION & VERIFICATION MATERIALS

94710-2 (Viscometers supplied separately)

94700-2 KV-4 LOW TEMPERATURE VISCOSITY BATH

ASTM D445; D446; IP 71; BS 188; BS 2000 Part 71; ISO 3104; ISO 3105; DIN 51 561; NF T60-100; FTM 791 305; JIS K2283

- Extended temperature range -60°C to +15°C
- Suitable for lubricants and JP 10 jet turbine fuels
- Accommodates up to 4 standard viscometer tubes
- Twin compressor cooling system
- Fluorescent backlighting
- Fan to reduce condensation on viewing window

A low temperature bench top kinematic viscometer bath with integral refrigeration that can accommodate up to 4 viscometer tubes.

Cooling is by two air cooled compressors giving a temperature range of 15 to -60°C, digitally controlled to within ±0.05°C. The bath jar is an unsilvered dewar type and is illuminated via back lighting. A fan is fitted to reduce condensation on the viewing window.

SUPPLIED WITH: mains lead and instruction manual.

BIO-FUEL TESTING

CALIBRATION & VERIFICATION MATERIALS

94700-2 (Viscometers supplied separately)

LOW TEMPERATURE KINEMATIC VISCOMETER BATHS

SPECIFICATIONS		
Seta Part No.	94710-2	94700-2
Temperature Range:	-40 to +20°C	-60 to +15°C
Temperature Stability:	±0.015 @-20°C (±0.01 @-40°C)	±0.05°C
Tube Capacity	up to 2	up to 4
Bath Fluid:	Methyl Alcohol or Denatured Ethyl Alcohol	Methyl Alcohol or Denatured Ethyl Alcohol
Bath Capacity:	2.9 Litres	15 Litres
Refrigerant:	R404A	CFC/HCFC free
Voltage:	220/240V, 50/60Hz	110/120V, 60Hz 220/240V, 50Hz
Power:	780W	3.1kW
Size (HxWxD):	55 x 49 x 53cm	66 x 56 x 55cm
Weight:	52kg	130kg

ACCESSORIES – Low Temperature Viscosity Baths

REQUIRED

KINEMATIC VISCOMETER TUBES:
Refer to pages 42 to 44.

94701-0 VISCOMETER TUBE HOLDER, for Cannon-Fenske tubes.
94702-0 VISCOMETER TUBE HOLDER, for Ubbelohde tubes.
94703-0 VISCOMETER TUBE HOLDER, for U Tube Reverse Flow tubes.
Holders for other types of tube available.

THERMOMETERS:
ASTM72C/IP67C or ASTM73C/IP68C or ASTM74C/IP69C or ASTM126C/IP71C or ASTM127C/IP99C or ASTM128C/IP33C

OPTIONAL

83750-3 SETATIME SIX CHANNEL QUARTZ TIMER, for time measurement to 999.99 seconds, accuracy 99.999% ±1 digit at 20°C, (for details see page 141).
84005-0 SPIRIT LEVEL
84008-0 BENCH VISCOMETER STAND, framework holds viscometer tubes near vertical while being prepared or while draining after use, complete with drainage tray.
97100-0 VISCOMETER TUBE CLEANER, (*for details see page 39*).

CALIBRATION, VERIFICATION & TRAINING

LOW TEMPERATURE VISCOSITY STANDARDS, *(for details see page 48).*

CONSUMABLES – Low Temperature Viscosity Baths

2 Years/2000 Tests - 94700-2 Only	Qty
94700-201 SPARES KIT	1

VISCOMETER TUBE CLEANER

97100-0 VISCOMETER TUBE CLEANER

- Cleans up to 6 tubes simultaneously
- Heated solvent vapour process
- 5 to 15 minute cleaning time
- Low solvent loss

A fast and efficient instrument that will clean all current types of viscometer tube internally and externally.

Up to six viscometer tubes can be suspended in the cleaning chamber. Solvent vapours, heated to 80°C, permeate the viscometer tubes, condensing on the internal and external surfaces, dissolving any residues from samples passed through the tube during a test.

A water fed cooling coil at the top of the chamber causes the vapour to continually condense and return to the receiver, minimizing solvent loss. The use of a low temperature recirculator to chill the cooling water will improve the solvent recovery rate.

SPECIFICATIONS	
Voltage:	100/130V, 60hz 200/240V, 50hz
Size (HxWxD):	80 x 40 x 44cm
Weight:	23kg

ACCESSORIES – Viscometer Tube Cleaner

OPTIONAL

99300-2 MINI LOW TEMPERATURE BATH/CIRCULATOR, (*for details see page 139*).
Note: Other items which may be required include: Solvents for tube cleaning.

97100-0 (Viscometers not included)

GLASS CAPILLARY KINEMATIC VISCOMETER TUBES

11619/** CALIBRATED U-TUBE VISCOMETERS

BS 188 Type BS/U

With constant and certificate of calibration. For transparent liquids requiring 13 to 40ml of sample.

U TUBE VISCOMETERS

Viscosity Range (mm^2/s)	Nominal Constant	Size Code	Seta Part No.
0.3 to 1.0	0.001	0	11619/00
0.9 to 3.0	0.003	A	11619/01
2.0 to 10	0.01	B	11619/02
6.0 to 30	0.03	C	11619/03
20 to 100	0.1	D	11619/04
60 to 300	0.3	E	11619/05
200 to 1000	1.0	F	11619/06
600 to 3.000	3.0	G	11619/07
2 000 to 10 000	10.0	H	11619/08

11637/** CALIBRATED U-TUBE REVERSE FLOW VISCOMETERS

BS 188 Type BS/IP/RF

With constant and certificate of calibration. For transparent and opaque liquids requiring a sample of 12 to 25ml.

U TUBE REVERSE FLOW VISCOMETERS

Viscosity Range (mm^2/s)	Nominal Constant	Size Code	Seta Part No.
0.6 to 3.0	0.003	1	11637/01
2.0 to 10	0.01	2	11637/02
6.0 to 30	0.03	3	11637/03
20 to 100	0.1	4	11637/04
60 to 300	0.3	5	11637/05
200 to 1 000	1.0	6	11637/06
600 to 3 000	3.0	7	11637/07
2 000 to 10 000	10.0	8	11637/08
6 000 to 30 000	30.0	9	11637/09
20 000 to 100 000	100.0	10	11637/10
60 000 to 300 000	300.0	11	11637/11

11625/** CALIBRATED SUSPENDED LEVEL VISCOMETERS

BS 188 Type BS/IP/SL

With constant and certificate of calibration. For transparent liquids requiring 22 to 40ml of sample.

SUSPENDED LEVEL VISCOMETERS

Viscosity Range (mm^2/s)	Nominal Constant	Size Code	Seta Part No.
3.5 to 10.0	0.01	1	11625/01
6.0 to 30	0.03	1A	11625/02
20 to 100	0.1	2	11625/03
60 to 300	0.3	2A	11625/04
200 to 1 000	1.0	3	11625/05
600 to 3 000	3.0	3A	11625/06
2 000 to 10 000	10.0	4	11625/07
6 000 to 30 000	30.0	4A	11625/08
20 000 to 100 000	100.0	5	11625/09

11628/** CALIBRATED SUSPENDED LEVEL VISCOMETERS SHORTENED FORM

BS 188 Type BS/IP/SL (S)

With constant and certificate of calibration. For transparent liquids requiring approximately 10ml of sample.

SUSPENDED LEVEL (SHORT) VISCOMETERS

Viscosity Range (mm^2/s)	Nominal Constant	Size Code	Seta Part No.
1.05 min	0.0008	1	11628/01
2.1 to 3.0	0.003	2	11628/02
3.8 to 10	0.01	3	11628/03
6 to 30	0.03	4	11628/04
20 to 100	0.1	5	11628/05
60 to 300	0.3	6	11628/06
200 to 1 000	1.0	7	11628/07
600 to 3 000	3.0	8	11628/08
2 000 to 10 000	10.0	9	11628/09

CALIBRATION CERTIFICATE (WORKS)

All glass capillary viscometer tubes are supplied with a works calibration certificate.

CALIBRATION CERTIFICATE (UKAS)

To order a glass capillary viscometer tube with a UKAS calibration certificate, add the suffix Z to the part number (i.e. 11677/02Z).

GLASS CAPILLARY KINEMATIC VISCOMETER TUBES

11634/** CALIBRATED CANNON-FENSKE ROUTINE VISCOMETERS

ASTM D445; D446; IP 71; ISO 3104; 3105

With constant and certificate of calibration (calibration data at 40°C with the constant quoted at 40°C and 100°C). For transparent liquids requiring approximately 7ml of sample.

CANNON-FENSKE ROUTINE VISCOMETERS

Viscosity Range (mm^2/s)	Nominal Constant	Size Code	Seta Part No.	Viscosity Std A	Viscosity Std B
0.5 to 2.0	0.002	25	11634/01	N0.8	N1.0
0.8 to 4.0	0.004	50	11634/02	N1.0	N2
1.6 to 8.0	0.008	75	11634/03	S3	S6
3.0 to 15	0.015	100	11634/04	D5	D10
7.0 to 35	0.035	150	11634/05	N10	S20
20 to 100	0.1	200	11634/06	N35	S60
50 to 250	0.25	300	11634/07	N100	S200
100 to 500	0.5	350	11634/08	S200	N350
240 to 1 200	1.2	400	11634/09	N350	S600
500 to 2 500	2.5	450	11634/10	N1 000	S2 000
1 600 to 8 000	8.0	500	11634/11	D5 000	N4 000
4 000 to 20 000	20.0	600	11634/12	N15 000	S30 000

11641/** CALIBRATED CANNON-FENSKE OPAQUE VISCOMETERS

ASTM D445; D446; IP 71; ISO 3104; 3105

With constant and certificate of calibration (calibration data at 40°C with the constant quoted at 40°C and 100°C). For transparent and opaque liquids requiring approximately 12ml of sample.

CANNON-FENSKE OPAQUE VISCOMETERS

Viscosity Range (mm^2/s)	Nominal Constant	Size Code	Seta Part No.	Viscosity Std A	Viscosity Std B
0.5 to 2.0	0.002	25	11641/01	N0.8	N1.0
0.8 to 4.0	0.004	50	11641/02	N1.0	N2
1.6 to 8.0	0.008	75	11641/03	S3	S6
3.0 to 15	0.015	100	11641/04	D5	D10
7.0 to 35	0.035	150	11641/05	N10	S20
20 to 100	0.1	200	11641/06	N35	S60
50 to 250	0.25	300	11641/07	N100	S200
100 to 500	0.5	350	11641/08	S200	N350
240 to 1 200	1.2	400	11641/09	N350	S600
500 to 2 500	2.5	450	11641/10	N1 000	S2 000
1 600 to 8 000	8.0	500	11641/11	D5 000	N4 000
4 000 to 20 000	20.0	600	11641/12	N15 000	S30 000

11663/** CALIBRATED ZEITFUCHS CROSS-ARM VISCOMETERS

ASTM D445; D446; IP 71; ISO 3104; 3105

With constant and certificate of calibration. For transparent and opaque liquids, requiring 3ml of sample.

ZEITFUCHS CROSS-ARM VISCOMETERS

Viscosity Range (mm^2/s)	Nominal Constant	Size Code	Seta Part No.
0.6 to 3.0	0.003	1	11663/01
2.0 to 10	0.01	2	11663/02
6.0 to 30	0.03	3	11663/03
20 to 100	0.1	4	11663/04
60 to 300	0.3	5	11663/05
200 to 1 000	1.0	6	11663/06
2600 to 3 000	3.0	7	11663/07
2 000 to 10 000	10.0	8	11663/08
6 000 to 30 000	30.0	9	11663/09
20 000 to 10 000	100 000	10	11663/10

11643/** CALIBRATED UBBELOHDE VISCOMETERS

ASTM D445; D446; IP 71; ISO 3104; 3105

With constant and certificate of calibration. For transparent liquids requiring 18ml of sample.

CALIBRATION CERTIFICATE (WORKS)

All glass capillary viscometer tubes are supplied with a works calibration certificate.

CALIBRATION CERTIFICATE (UKAS)

To order a glass capillary viscometer tube with a UKAS calibration certificate, add the suffix Z to the part number (i.e. 11677/02Z).

UBBELOHDE VISCOMETERS

Viscosity Range (mm^2/s)	Nominal Constant	Size Code	Seta Part No.	Viscosity Std A	Viscosity Std B
0.3 to 1	0.001	0	11643/01	N.04	N0.8
0.6 to 3	0.003	0C	11643/02	N1.0	N2
1 to 5	0.005	0B	11643/03	N2	S3
2 to 10	0.01	1	11643/04	S3	S6
6 to 30	0.03	1C	11643/05	D10	S20
10 to 50	0.05	1B	11643/06	S20	N35
20 to 100	0.1	2	11643/07	N35	S60
60 to 300	0.3	2C	11643/08	N100	S200
100 to 500	0.5	2B	11643/09	S200	N350
200 to 1 000	1.0	3	11643/10	N350	S600
600 to 3 000	3.0	3C	11643/11	N1000	S2 000
1 000 to 5 000	5.0	3B	11643/12	S2000	D7 500
2 000 to 10 000	10.0	4	11643/13	D7500	S8 000
6 000 to 30 000	30.0	4C	11643/14	N15 000	S30 000
10 000 to 50 000	50.0	4B	11643/15	N15 000	S30 000
20 000 to 100 000	100.0	5	11643/16	N/A	N/A

GLASS CAPILLARY KINEMATIC VISCOMETER TUBES

VACUUM CAPILLARY VISCOMETERS FOR ASPHALTS

11675/** CALIBRATED CANNON-MANNING VACUUM CAPILLARY VISCOMETERS

ASTM D2171; IP 222

CANNON-MANNING VACUUM VISCOMETERS		
Viscosity Range (mm^2/s)	Size Code	Seta Part No.
0.036 to 0.8	4	11675/01
0.12 to 2.4	5	11675/02
0.36 to 8	6	11675/03
1.2 to 24	7	11675/04
3.6 to 80	8	11675/05
12 to 240	9	11675/06
36 to 800	10	11675/07
120 to 2 400	11	11675/08
360 to 8 000	12	11675/09
1 200 to 24 000	13	11675/10
3 600 to 80 000	14	11675/11

11677/** CALIBRATED MODIFIED KOPPERS VACUUM VISCOMETERS

ASTM D2171; IP 222

MODIFIED KOPPERS VACUUM VISCOMETERS		
Viscosity Range (mm^2/s)	Size Code	Seta Part No.
42 to 800	25	11677/01
180 to 3 200	50	11677/02
600 to 12 800	100	11677/03
2 400 to 52 000	200	11677/04
8 600 to 200 000	400	11677/05

For the viscometers above, exact calibration factors must be determined with viscosity standards.

11676/** CALIBRATED ASPHALT INSTITUTE VACUUM CAPILLARY VISCOMETERS

ASTM D2171; IP 222

ASPHALT INSTITUTE VACUUM VISCOMETERS		
Viscosity Range (mm^2/s)	Size Code	Seta Part No.
42 to 800	25	11676/01
180 to 3 200	50	11676/02
600 to 12 800	100	11676/03
2 400 to 52 000	200	11676/04
9 600 200 000	400R	11676/06*
38 000 to 800 000	800R	11676/07*

** Special design for roofing asphalts, having additional marks at 5 and 10mm above timing mark. Using these marks, the maximum viscosity range is increased from that using the bulb B calibration factor.*

CALIBRATION CERTIFICATE (WORKS)

All glass capillary viscometer tubes are supplied with a works calibration certificate.

CALIBRATION CERTIFICATE (UKAS)

To order a glass capillary viscometer tube with a UKAS calibration certificate, add the suffix Z to the part number (i.e. 11677/02Z).

VISCOSITY COMPARATORS

4

VISGAGE POCKET COMPARATORS

- Determine In-Service condition of lubrication oils
- Quick and easy viscosity check
- Viscosity range 40 to 1400 Saybolt seconds and 0 to 400mm²/s
- 5% accuracy
- Plunger action sampling
- Calibrated scale

A pocket sized, quick, 'on site' viscosity test for in-service lubricating oils and similar applications.

The Visgage contains two tube and ball sets, graduated and calibrated in Saybolt seconds @ 100°F or Centistokes (mm^2/s) @ 40°C (depending on model). One tube is factory filled with a reference oil, while the other can be loaded with the sample by a simple plunger action.

By tilting the Visgage until the ball in the reference oil reaches a calibration mark, the position of the ball in the sample tube can be read directly on the graduated scales, giving the viscosity in Saybolt seconds. With practice an accuracy within 5% of true viscosity can be achieved.

SUPPLIED WITH: pocket carrying case, with operating instructions and reference table of the approximate dilution of lubricating oils by diesel fuel contamination.

VISGAGE VISCOSITY COMPARATORS		
Viscosity	Seta part No.	Description
40 to 800 Saybolt Seconds @ 100°F	95000-0	VISGAGE, FOR LIGHT OILS
400 to 1 400 Saybolt Seconds @ 100°F	95010-0	VISGAGE, FOR HEAVY OILS
0 to 400 Centistokes (mm^2/s) @ 40°C	95020-0	VISGAGE, FOR LIGHT OILS
20 to 400 Centistokes (mm^2/s) @ 40°C	95030-0	VISGAGE, FOR HEAVY OILS

SPECIFICATIONS	
Size (HxWxD):	5 x 5 x 25cm
Weight:	0.5kg

95000-0

22950-2 SETA TRI-GAUGE VISCOSITY COMPARATOR

- Ideal for In-Service lubricant oil testing
- Rapid and easy Go/No-Go viscosity test
- Quick comparison of approximate relative viscosity
- 10ml sample and reference oil size.
- Suitable for clear and opaque liquids
- Engraved scale

A transparent perspex block with three tube and ball testers that allow a simple comparison of a sample to reference oils of higher and lower viscosity.

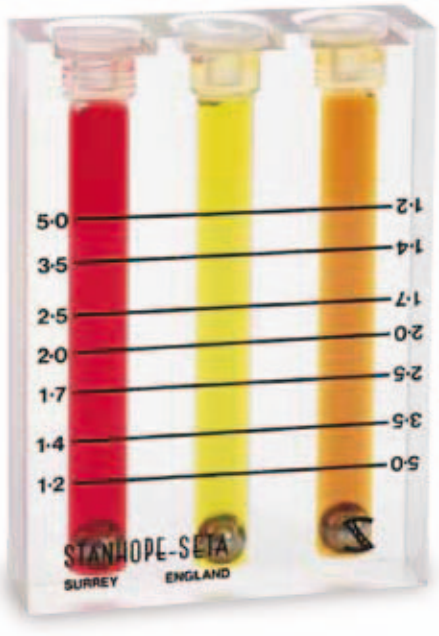
The outer tubes are used for reference oils to the highest and lowest permitted viscosity. The sample is placed in the centre tube. By inverting the Tri-Gauge and observing the order in which the balls fall to the bottom of the tubes a simple Go/No-Go decision can be made.

The relative viscosities can be determined by reading the position of the sample tube ball against the scale when the first ball reaches the bottom of the tube. The scale is graduated with the multiplication factor to be applied to the viscosity of the oil in the tube of the first ball to reach the bottom. If the viscosity of that oil is known, the viscosities of the sample can be deduced to a reasonable degree of accuracy.

The reference oils can be left in the Tri-Gauge tubes in readiness for future tests.

SUPPLIED WITH: special top closures, and instructions for use.

SPECIFICATIONS	
Size (HxWxD):	5 x 5 x 25cm
Weight:	0.5kg



22950-2 (Colours shown for demonstration purposes only)

BROOKFIELD VISCOMETER BATH

94830-3 SIMAIR® LOW TEMPERATURE BATH

ASTM D2983; IP 267 Method A*

- -40 to +30°C temperature range
- Accepts up to 12 SimAir® test cells
- Internal refrigeration unit
- Mounting for Brookfield Viscometer

The 94830-3 is a liquid filled, refrigerated viscometer bath that, when used in conjunction with patented SimAir® test cells and a Brookfield LV type rotational viscometer, meets the requirements of tests to ASTM D2983.

A digital temperature controller, 600W heater and refrigeration unit allows a bath temperature range of -40 to +30°C with a stability of ±0.1°C The refrigeration system uses R507, a non CFC and non-ozone depleting refrigerant, and is capable of a cool down rate of approximately 20°C/hr.

An internal air flow system provides a blanket of warm air to protect the sample from moisture and prevent condensation build up on the oversize back lit viewing window.

In the event of a brief power interruption, a power saver facility allows the test to resume after power is restored. Safety devices include over-temperature , high pressure and low bath fluid cut-outs.

The casing is manufactured from stainless steel and thermoplastic. Mounting points for a Brookfield LV viscometer are situated on the top of the bath, and a 12 position carousel allows for rapid changeover between samples.

SUPPLIED WITH: viscometer mounting bracket, 12 position carousel, insulated flask lid, carousel port plugs, moisture cover, stirrer bar, spindle storage block, mains lead and instruction manual.

Notes: Supplied without Brookfield viscometer or SimAir® test cells.
SimAir® is a trademark of Tannas Co.

** This bath, when used with SimAir® test cells simulates the Air Bath used for tests to ASTM D2983 and IP 267 Method A. It is **not** to be confused with the Liquid Bath used in IP 267 Method B.*

A complete setup for measuring Brookfield Viscosity; a 94800-0 Viscometer mounted on a 94830-3 Bath with a 94835-0 SimAir® Test Cell

SPECIFICATIONS	
Temperature range:	-40 to +30°C
Temperature stability:	±0.1°C
Bath type:	Liquid
Test cell capacity:	up to 12
Heating capacity:	600W
Cooling rate:	20°C/Hr
Refrigerant:	R507 non-ozone depleting
Voltage:	220V, 50Hz
Size (HxWxD):	47 x 42 x 66cm
Weight:	36kg

ACCESSORIES – SimAir® Low Temperature Bath

REQUIRED

94800-0	BROOKFIELD LV VISCOMETER
94835-0	SIMAIR® TEST CELL ASSEMBLY, (1 required for each carousel position in use).

BROOKFIELD VISCOMETER

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94800-0 BROOKFIELD LV VISCOMETER

ASTM D2983; IP 267 Methods A & B

- 15 to 6,000,000 centipoise viscosity range
- 0.01 to 200rpm speed range
- Built in temperature probe
- Digital and analogue outputs

The 94800-0 is a digital, rotary Brookfield LV viscometer suitable for measuring viscosity of ATFs, lubricants, gear oils and hydraulic fluids in the range of 15 to 6 000 000 centipoise.

The viscometer features a speed range of 0.01 to 200 rpm in 54 steps and can continuously display viscosity (cP or mPa s), temperature (°C or °F), shear rate, shear stress, and % torque. The data can be displayed on the instrument or output via the parallel printer port, RS232 serial port, or as an analogue voltage for a chart recorder. An integral RTD probe measures the sample temperature.

Operation is via a large button and display panel. Alternatively, using the supplied software, it is possible to create test programmes with up to 25 steps on a personal computer and upload them to the viscometer when required.

SUPPLIED WITH: four LV type spindles, temperature probe, spindle guard, basic software, mains lead and instruction manual.

SPECIFICATIONS

Viscosity Range:	15 to 6 000 000 centipoise
Speed:	0.01 to 200 rpm
Parameters:	Viscosity, Temperature, % Torque, Shear Rate, Shear Stress
Output Ports:	Parallel, RS232 Serial, Analogue Voltage
Voltage:	220/240V, 50Hz
Size (HxWxD):	26 x 15 x 25cm
Weight:	10.5kg

CALIBRATION CERTIFICATE (WORKS)

SOFTWARE INCLUDED

94835-0 SIMAIR® TEST CELL ASSEMBLY

ASTM D2983; IP 267 Method A

- Simulates the cooling rate of an air bath
- Liquid bath is held at the desired test temperature
- Each cell is independent and can be added at any time for a complete analysis - no need for grouping samples unless desired
- Improved precision, rapid turn-around time and ease of analysis

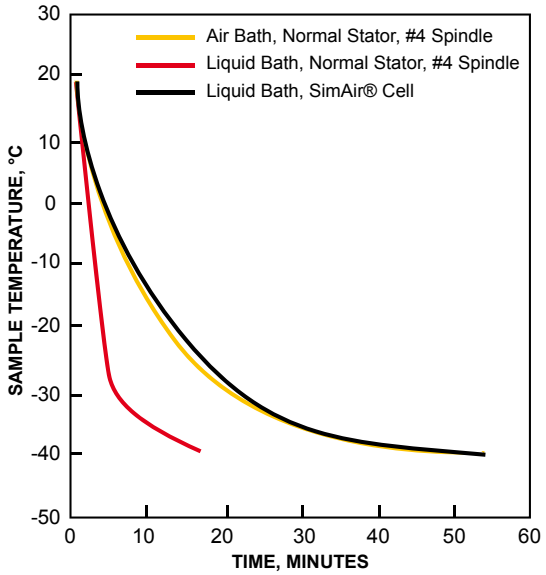
The SimAir® test cell, when used in conjuction with a suitable liquid bath, accurately simulates the characteristics of an air bath conforming to the cooling rates in Annex 2 of ASTM D2983 and IP 267 Method A.

The SimAir® test cell containing the sample is immersed in a liquid bath that has stabilised at the temperature required for final analysis. Heat transfer through the SimAir® test cell to the sample accurately replicates the cooling influence of an air bath with a cooling rate greater than 60°C/hr (see graph).

The stability of using a liquid bath at a fixed temperature, and not having to rely on a controller to follow an accurate cooling curve leads to more consistant and accurate results.

SUPPLIED WITH: stator, rotor, rotor support and quick connector.

94835-0



SAYBOLT, REDWOOD & BITUMEN VISCOMETER BATH

83201-2 SAYBOLT-REDWOOD VISCOMETER BATH

ASTM D88; E102; IP 70 (obs); BS 434; AASHTO T72; FTM 791 304

- 2 cup capacity
- Saybolt, Redwood or Bitumen viscometer kits available
- Ambient to 250°C (482°F)
- Stability ±0.03°C up to 150°C (±0.1°C above 150°C)
- 14 litre oil filled bath
- 1000W heater
- Cooling coil

An oil filled bath designed to heat two sample filled viscometer cups and then maintain them at a constant temperature while the flow time is measured.

The 14 litre bath has a temperature range of ambient to 250°C (482°F) with a stability of ±0.03°C (±0.1 above 150°C). It is heated by a thermostir unit with a stand-alone digital temperature controller. A fine temperature adjustment control is fitted to the thermostir allowing very accurate temperature to be set. An integral cooling coil, when connected to a cold water supply, provides precise control when the set temperature is near the ambient temperature of the laboratory. The bath is fitted with a fail-to-safe thermal cut-out and a drain tap.

Viscosity kits are available for Redwood No.1, Redwood No.2, Saybolt, and Bitument tests. Each kit contains two sets of flow cups and any additional components (except thermometers and a stopwatch) to carry out the relevant test.

SUPPLIED WITH: remote temperature controller, mains leads, interconnection lead and instruction manual.

Note: Requires one of the viscosity kits listed in accessories.

83201-2 and Accessories

ACCESSORIES – Viscometer Bath

REQUIRED

22750-2	DIGITAL STOPWATCH, hand-held, 0.1s resolution, (*for details see page 141*).
83250-0	SAYBOLT VISCOSITY KIT (D88), comprises Cup Adaptor (qty 2), Saybolt Viscometer Cup (qty 2), Universal Orifice Tip (qty 2), Withdrawl Tube, Thermometer Support (qty 2), Filter Funnel, 60ml Receiving Flask (qty 2), Displacement Ring (qty 2), Cover (qty 2), Spirit Level (qty 2).
	OR
83253-0	REDWOOD No. 1 VISCOSITY KIT (IP 70), comprises No. 1 Cup Adaptor (qty 2), Redwood No. 1 Viscometer Cup (qty 2), Clip (qty 2), Kohlrausch Flask (qty 20), Cup Cover (qty 2), Spirit Level (qty 2).
	OR
83255-0	REDWOOD No. 2 VISCOSITY KIT (IP 70, BS 434), comprises Redwood Adaptor Key, IP 70 Viscometer Cup (qty 2), BS 434 Viscometer Cup (qty 2), Clip (qty 2), Kohlrausch Flask (qty 20), Cup Cover (qty 2), Spirit Level (qty 2).
	OR
83257-0	BITUMEN VISCOSITY KIT (E102), comprises Cup Adaptor (qty 2), Bitumen Viscometer Cup (qty 2), Universal Orifice Tip (qty 2), Withdrawl Tube, Thermometer Support (qty 2), Filter Funnel, 60ml Receiving Flask (qty 2), Displacement Ring (qty 2), Cover (qty 2), Spirit Level (qty 2).
94633-0	BATH OIL, 20 litres, for filling viscometer baths in the temperature range of ambient to 80°C.
	OR
94635-0	BATH OIL, 20 litres, for filling viscometer baths in the temperature range of 80 to 120°C.
	OR
94632-0	SILICONE BATH OIL, 20 litres, for filling viscometer baths in the temperature range of 100 to 150°C.

THERMOMETERS:

For ASTM D88:-	ASTM17F/17C or ASTM18F/18C or ASTM19F/19C or ASTM20F/20C or ASTM21F/21C or ASTM22F/22C
For ASTM E102:-	ASTM77F or ASTM78F or ASTM79F or ASTM80F or ASTM81F or ASTM108F or ASTM109F
For IP 170:-	IP8F or IP8C or IP9F or IP9C or IP10F or IP10C
For BS 434:-	BS110C/110

Note: ASTM D88 covers Saybolt Universal and Saybolt Furol viscosities of petroleum products in the temperature range 21 to 99°C.
ASTM E102 covers Saybolt Furol viscosity in the temperature range 121 to 232°C

SPECIFICATIONS

Temperature Range:	Ambient to 250°C (482°F)
Temperature Stability:	±0.03 up to 150°C (302°F) ±0.1 above 150°C (302°F)
Capacity:	14 litres
Bath Fluid:	Oil
Test Positions:	2
Viscosity Kits Accepted	Redwood No.1 Redwood No.2 Saybolt Bitumen
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Power:	1.1kW
Size (HxWxD):	79 x 49 x 31cm
Weight:	20kg

ALSO AVAILABLE FROM SETA;

22620-2 SETA REDWOOD NO. 1 VISCOMETER

IP 70 (obs)

23210-2 SETA TAR VISCOMETER

IP 72; BS 2000 Part 72; STPTC RT2 and RT3; NF T66-005

FLOW CUPS

4

Note: In the following tables all viscosities and flow times quoted are approximate values at 25°C. Cup verification oils are supplied in a 500ml container along with a UKAS calibration certificate.

SETA BS-ISO FLOW CUPS

ASTM D5125; EN 535; ISO 2431; DIN 53 224; NF 30 070 (obs)

- Viscosity range from 8 to 2000mm²/s (cSt)
- Aluminium body with stainless steel jet
- Use for 'break-thread' flow measurement

Note: Cup 23611-0 is not in the current BS-ISO series, but is offered for use with high viscosity samples.

SETA BS-ISO FLOW CUP

FLOW CUP				VERIFICATION OIL (CALIBRATION CERTIFICATE (UKAS))		
Viscosity Range (mm²/s)	Size Code	Orifice Dia (mm)	Seta Part No.	Viscosity (mm²/s)	Flow Time (seconds)	Seta Part No.
8 to 40	3	3	23560-0	26.2	67 to 70	99890-0
30 to 130	4	4	23550-0	65.5	48 to 53	99891-0
100 to 300	5	5	23540-0	115	35 to 38	99892-0
180 to 700	6	6	23610-0	398	54 to 60	99893-0
600 to 2 000	8	8	23611-0			

SETA B FLOW CUPS

- Kinematic viscosity range from 0 to 5 000 mm²/s (cSt)
- Brass construction

Note: This type of cup has been in popular use for many years but does not conform to the current requirements of ISO 2431 - EN535. Formerly required for BS 3900 Section A6.

SETA B FLOW CUP

FLOW CUP				VERIFICATION OIL (CALIBRATION CERTIFICATE (UKAS))		
Viscosity Range (mm²/s)	Jet Code	Orifice Dia (inches)	Seta Part No.	Viscosity (mm²/s)	Flow Time (seconds)	Seta Part No.
0 to 50	2	0.093	23570-0	65.5	146 to 162	99891-0
40 to 120	3	0.125	23580-0	65.5	54 to 59	99891-0
80 to 250	4	0.156	23600-0	115	41 to 45	99892-0
150 to 1 000	5	0.187	23590-0	229	42 to 46	99896-0
1 000 to 5 000	6	0.281	23510-0	1 130	49 to 54	99897-0

SETA FORD CUPS

ASTM D1200

- Kinematic viscosity range from 20 to 360 mm²/s (cSt)
- Brass construction

SETA FORD FLOW CUP

FLOW CUP				VERIFICATION OIL (CALIBRATION CERTIFICATE (UKAS))		
Viscosity Range (mm²/s)	Jet Code	Orifice Dia (inches)	Seta Part No.	Viscosity (mm²/s)	Flow Time (seconds)	Seta Part No.
20 to 80	2	0.0995	23340-2	65.5	61 to 66	99891-0
40 to 220	3	0.134	23350-2	65.5	33 to 36	99891-0
74 to 360	4	0.162	23360-2	1 150	32 to 35	99892-0

SETA AFNOR FLOW CUPS

NFT 30-014

- Kinematic viscosity range from 5 to 5100 centipoise
- Brass construction

SETA AFNOR FLOW CUP

FLOW CUP				VERIFICATION OIL (CALIBRATION CERTIFICATE (UKAS))		
Viscosity Range (cP)	Cup Code	Orifice Dia (mm)	Seta Part No.	Viscosity (cP)	Flow Time (seconds)	Seta Part No.
5 to 140	1	2.5	23215-0	N/A	N/A	N/A
50 to 1 100	2	4.0	23216-0	N/A	N/A	N/A
510 to 5 100	3	6.0	23217-0	N/A	N/A	N/A

SETA ZAHN FLOW CUPS

ASTM D816 (obs); D1084 (obs); D4212

- Dynamic viscosity range from 20 to 1200 centipoise
- Use for 'break-thread' flow measurement

Simple comparative instrument for checking the relative viscosity of batches of viscous fluids.

23750-0
(Dial Thermometer supplied separately)

23660-0 and 22361-0
(Flow Cup supplied separately)

SETA ZAHN FLOW CUP

FLOW CUP (OPTIONAL CALIBRATION CERTIFICATE (WORKS))				VERIFICATION OIL (CALIBRATION CERTIFICATE (UKAS))		
Viscosity Range (cP)	Cup Code	Seta Part No. (std)	(cert)	Viscosity (mm²/s)	Flow Time (seconds)	Seta Part No.
20 to 85	1	23750-0	23750-0Y	26.2	52 to 54	99890-0
30 to 170	2	23760-0	23760-0Y	115	45 to 48	99892-0
170 to 550	3	23770-0	23770-0Y	453	44 to 48	99894-0
200 to 900	4	23780-0	23780-0Y	453	34 to 37	99894-0
250 to 1 200	5	23790-0	23790-0Y	1 680	70 to 78	99895-0

ACCESSORIES – Flow Cups

OPTIONAL

23520-0	SETA PROTECTIVE COLLAR FOR TYPE B AND FORD CUPS
23660-0	SETA STAND, to support all flow cups, with adjustable feet for levelling, spirit level, and square glass scraper.
23680-0	SETA SPIRIT LEVEL, circular type to suit all cups.
23661-0	SIGHT SCREEN, FLOW CUP, aids detection of 'break thread'.
22750-2	DIGITAL STOPWATCH, (*for details see page 141*).

THERMOMETERS:

ASTM90C or 91C

17730-0	DIAL THERMOMETER, bimetal type, -30 to +60°C for Seta Zahn flow cups.

VISCOSITY STANDARDS

- Full compliance to ASTM, IP & other method protocols
- Manufactured under ISO 17025 quality standards
- UKAS Certified
- Supplied in 500 ml containers
- Tamper evident packaging for security and proof of integrity
- Valid for 2 years

Viscosity standards supplied by Seta are exactly equivalent to, and interchangeable with other recognised viscosity standards that adopt the reference numbers shown in the product table listed below, as specified in many international test methods and often referred to for calibration requirements.

Seta supplied viscosity standards are manufactured in full compliance with ASTM D2162.

Note: The viscosity values in the following table are approximate and are for guidance in choosing the appropriate standard only. The actual values will be indicated on the container.

CALIBRATION CERTIFICATE (UKAS)

GENERAL PURPOSE VISCOSITY STANDARDS

KINEMATIC VISCOSITY mm²/S (cSt)											SAYBOLT VISCOSITY		
Standard Ref No	Seta Part No.	20.00°C 68.00°F	25.00°C 77.00°F	37.78°C 100.00°F	40.00°C 104.00°F	50.00°C 122.00°F	60.00°C 140.00°F	80.00°C 176.00°F	98.89°C 210.00°F	100.00°C 212.00°F	SUS 100.00°F	SFS 210.00°F	SFS 122.00°F
S3	99784-0	4.6	4.1	3.1	2.9	2.4	2.1	1.5	1.2	1.2			
D5	99830-0	7.1	6.1		4.1	3.3				1.5			
S6	99785-0	10	8.8	6	5.7	4.5	3.6	2.5	1.9	1.9			
D10	99831-0	15	12	8.2	7.7	5.9	4.6	3.1	2.3	2.3			
N10	99771-0	21	17	11	10	7.4	5.7	3.7	2.7	2.6			
S20	99786-0	44	34	20	18	13	9.4	5.7	3.9	3.8	97		
N35	99832-0	85	65	36	32	22	16	8.8	5.7	5.6	155		
S60	99787-0	161	119	60	54	35	24	13	7.9	7.7	280		
N100	99833-0	324	234	113	100	62	41	21	12	12	522		
S200	99788-0	649	456	205	181	107	68	32	18	17	950	90	
D500	99834-0	830	579		224	131		38		20			
N350	99835-0	1 235	851	366	320	184	113	50	27	26	1693	131	
D1000	99836-0	1 696	1 159		423	239				32			
S600	99789-0	2 146	1 455	598	520	290	173	73	38	37		180	137
N1000	99837-0	4 490	2 981	1165	1 004	538	309	122	61	59			
S2000	99790-0	7 946	5 222	1 983	1 700	890	499	189	90	87			
D5000	99838-0	8 626	5 644		1 818	945				90			
D7500	99839-0	13 383	8 702	3207	2 735	1 397	766			122			
N4000	99840-0	17 966	11 627	4216	3589	1 811	9981	346	155	149			
S8000	99791-0	35 264	22 566	7 981	6 748	3 327	1760	589	253	241			
N15000	99841-0	70 582	44 855	15541	13 087	6 342	3 289	1 054	434	413			
S3000	99792-0		79 747	27 285	22 946	10993	5623	1 756	700	667			

LOW TEMPERATURE VISCOSITY STANDARDS

DYNAMIC VISCOSITY mPa s (cP)																		
Standard Ref No	Seta Part No.	-40°C -40°F	-34.44°C -30°F	-28.89°C -20°F	-27°C -16.6°F	26.5°C -15.7°F	-26.11°C -15°F	-26°C -14.8°F	-25.5°C -13.9°F	-25°C -13°F	23.33°C -10°F	-17.78°C 0°F	-13°C 8.6°F	-12.5°C 9.5°F	-12.22°C 10°F	-12°C 10.4°F	-11.5°C 11.3°F	-11°C 12.2°F	-6.67°C 20°F
N27B	99793-0	37 449	13 281	5 313			3 504				2 360	1 145							
N115B	99794-0			142 782			95 380				65 157	32 353			17 108				9 533
N480B	99720-0				184 000	164 400	152 500	148 400	133 600	120 400									
N1400B	99722-0												179 400	164 300	156 500	151 200	137 600	126 100	

JET FUEL (JF1) VISCOSITY STANDARD

KINEMATIC VISCOSITY mm²/S (cSt)		
Standard Ref No	Seta Part No.	-20°C -4°F
JF1	99798-0	3.7

VISCOSITY STANDARDS

SETAVIS VISCOSITY STANDARDS

Setavis KAV Duplex Tubes should be individually verified or calibrated at the intended test temperature and nearest flow time, using certified viscosity standards. For calibration two standards are required for each tube to provide at least 50% difference in flow time as required by ASTM D446.

VISCOMETER TUBES		40°C RANGE STANDARDS				100°C RANGE STANDARDS			
		First Standard		Second Standard		First Standard		Second Standard	
Seta Part No.	Nominal Tube Constant	Seta Part No.	Nominal Viscosity (mm^2/s)	Seta Part No.	Nominal Viscosity (mm^2/s)	Seta Part No.	Nominal Viscosity (mm^2/s)	Seta Part No.	Nominal Viscosity (mm^2/s)
83605-003	0.05	99784-0	2.9	99785-0	5.7	99786-0	3.9	99787-0	7.5
83605-004	0.1	99831-0	7.5	99786-0	18	99787-0	7.5	99833-0	13
83605-005	0.3	99786-0	18	99832-0	29	99834-0	21	99789-0	36
83605-006	0.5	99832-0	29	99787-0	54	99789-0	36	99837-0	57
83605-007	1	99833-0	114	99788-0	181	99790-0	83	99840-0	137
83605-008	3	99788-0	181	99835-0	324	99791-0	242	99841-0	406
83605-009	5	99835-0	324	99789-0	518	99841-0	406	99792-0	628

MULTI-TEST VERIFICATION MATERIALS

- A highly cost effective solution to laboratory verification requirements
- Verification to ASTM/CEN/ISO/IP and equivalent test procedures

Incorrect determination of a result can have far reaching financial and safety implications. The growing use of automated instrumentation increases the possibility that incorrect results may go undetected and in addition the early indication of bias is a useful warning to minimise production 'giveaway'.

Multi Test Verification Materials (MTVM) allow routine monitoring of instrument performance and are also particularly helpful in training personnel on new equipment and test methods. We recommend the purchase of MTVM's with new instrumentation to assist with installation and commissioning.

Seta MTVMs are unique because, unlike most other certified reference materials that are only suitable for validating a specific parameter/value, MTVM's enable a user to validate different tests and instrumentation using the same sample material.

MTVMs are blended by a major multi-national refining company in conformance with ISO 9001 and ISO/IEC/EN 17025 (ISO Guide 25 and EN 45001) and tested internationally by a statistically significant number of laboratories to determine certified values.

Seta MTVMs are supplied in 500ml containers and have a 18 month validity from date of supply.

The following table lists the available MTVMs:

MTVMs	
99850-0	SETA MTVM - KEROSINE 500ml
99851-0	SETA MTVM - GAS OIL 500ml
99852-0	SETA MTVM - FUEL OIL 500ml
99853-0	SETA MTVM - LUBRICATING OIL 500ml
99854-0	SETA MTVM - MOTOR GASOLINE 500ml
99856-0	SETA MTVM - BITUMEN 250ml
99908-0	SETA BIO MTVM - GAS OIL 500ml

CONFORMANCE CERTIFICATE (WORKS)

REFRIGERATED CLOUD & POUR POINT BATHS

ASTM D97; ASTM D2500; ASTM D5853; IP 15; IP 219; IP 441; BS 2000 Parts 15 & 219; ISO 3015; ISO 3016; DIN 51 597; EN 23015; NF T60-105; FTM 791 201; JIS K2269

- Individually temperature controlled compartments
- Two litre bath capacity in each compartment
- Four air wells in each compartment
- Two stage 'CFC free' refrigeration system

Three and four compartment refrigerated cloud and pour point baths. Each 2 litre compartment is individually temperature controlled and can accommodate four Air Wells.

Note: Due to the low operating temperature of these baths it is recommended that the compartments are filled with Butyl Glycol.

SPECIFICATIONS

Seta Part No:	93531-7	94100-3
Compartment Quantity:	3 + 1 low temperature	3
Compartment Volume:	2 litre	2 litre
Total Test Positions:	16	12
Temperature Range:	Ambient to -35°C (x3) -35°C to -51°C (x1)	Ambient to -34°C
Ambient Temp Range:	15°C to 32°C	15°C to 32°C
Cooldown Time: (single compartment)	approx 2hrs (from 32°C to -51°C)	approx 1hr (from 32°C to -34°C)
Refrigerant:	CFC Free; First Stage R134a; Second Stage R507	CFC Free; Single Stage R507
Voltage:	110/120V, 60Hz 220/240V, 50Hz	220/240V, 50Hz
Power:	1.8kW	750W
Size (HxWxD):	95 x 63 x 63cm	60 x 60 x 85cm
Weight:	115kg	115kg

93531-7 SETA CLOUD AND POUR POINT CRYOSTAT

- Three compartments ambient to -35°C
- One compartment -35°C to -51°C
- Independant temperature control
- Heated 'anti-condensation' lid

Four 2 litre compartments, each independantly temperature controlled. Three compartments have a temperature range of ambient to -35°C (0 to -35 ± 1.5°C). One low temperature compartment has a range of -35 to -51°C (± 1.5°C). Refrigeration is accomplished by a two stage CFC free system. An internal 'spare' canister of R507 refrigerant allows easy recharging of the second stage. The lid is electrically heated to prevent the formation of ice and condensation.

SUPPLIED WITH: 16 test jars (each comprising graduated glassware, thermometer cork, insulating gasket and disk), a compartment thermometer, and instruction manual.

BIO-FUEL TESTING

CALIBRATION & VERIFICATION MATERIALS

93531-7
(Sample thermometers supplied separately)

94100-3 SETA COMPACT CLOUD AND POUR POINT CRYOSTAT

- Three compartments
- Temperature range ambient to -34°C

Three 2 litre compartments independantly temperature controlled between ambient and -34°C with a stability of ± 1.5°C.

SUPPLIED WITH: 12 test jars (each comprising graduated glassware, thermometer cork, insulating gasket and disc), a compartment thermometer, and instruction manual.

BIO-FUEL TESTING

CALIBRATION & VERIFICATION MATERIALS

TECHNICAL DATASHEETS AVAILABLE

94100-3
(Sample thermometers supplied separately)

REFRIGERATED CLOUD & POUR POINT BATHS

ACCESSORIES – C&PP Cryostats

REQUIRED

THERMOMETERS:

High Cloud and Pour: ASTM5C/IP1C or ASTM5F/IP1F

Low Cloud and Pour: ASTM6C/IP2C or ASTM6F/IP2F

Pre-conditioning to ASTM D97 for fuel oils, heavy lubricant base stock, and products containing residual fuel components: ASTM 61C/IP63C or ASTM 61F.

Note: One thermometer is required for each test jar in simultaneous use (in addition to the compartment thermometer supplied with the unit)

OPTIONAL

94110-0	TROLLEY, for 94100-2 only
11500-0	COPPER CORROSION TEST VESSEL, for ASTM D5853, stainless steel. 'O' ring sealed screw-top closure. Max pressure 700kPa (100 psi).

CALIBRATION, VERIFICATION & TRAINING

99851-0	MULTI-TEST VERIFICATION MATERIAL, ASTM D2500 - IP 219; ASTM D6371; IP 309 Gas Oil; EN 116, (*for details see page 150).*
99852-0	MULTI-TEST VERIFICATION MATERIAL, ASTM D97 - IP 15 Fuel Oil, (*for details see page 151*).
99853-0	MULTI-TEST VERIFICATION MATERIAL, ASTM D97 - IP 15 Lubricating Oil, (*for details see page 151*).
99908-0	BIO-FUEL MULTI-TEST VERIFICATION MATERIAL, (*for details see page 151*).

CONSUMABLES – C&PP Cryostats

2 Years/2000 Tests		Qty
11000-002	GRADUATED JAR & CORK, pack of 10	5
11000-003	INSULATING GASKET, pack of 20	2
11000-004	INSULATING DISC, pack of 20	2
93531-001	COMPARTMENT THERMOMETER	1
93531-202	CORK-JAR& THERMOMETER WELL pack of 10	12

5

CLOUD & POUR POINT BATH

11010-2 SETA CLOUD AND POUR POINT BATH

ASTM D97; ASTM D2500; ASTM D5853; IP 15; IP 219; IP 441; BS 2000 Parts 15 & 219; ISO 3015; ISO 3016; EN 23015; DIN 51 597 (obs); NF T60-105; FTM 791 201; JIS K2269

- Four test positions
- Temperature range 9°C to -69°C

A test bath with stainless steel cover and a drain tap. Accommodates four test jackets and a bath thermometer.

SUPPLIED WITH: four graduated jars, corks, insulating gaskets and discs.

BIO-FUEL TESTING

CALIBRATION & VERIFICATION MATERIALS

Note: Requires Freezing Mixture as specified in the test method.

11010-2
(Thermometers supplied separately)

ACCESSORIES – C&PP Bath

REQUIRED

THERMOMETERS:

High Cloud and Pour: ASTM5C/IP1C or ASTM5F/IP1F

Low Cloud and Pour: ASTM6C/IP2C or ASTM6F/IP2F

Pre-conditioning to ASTM D97 for fuel oils, heavy lubricant base stock, and products containing residual fuel components: ASTM 61C/IP63C or ASTM 61F.

Note: One thermometer is required for each test jar in simultaneous use (in addition to the supplied compartment thermometer .

OPTIONAL

11500-0	COPPER CORROSION TEST VESSEL, for ASTM D5853, stainless steel. 'O' ring sealed screw-top closure. Max pressure 700kPa (100 psi).

CALIBRATION, VERIFICATION & TRAINING

99851-0	MULTI-TEST VERIFICATION MATERIAL, ASTM D2500 - IP 219; ASTM D6371; IP 309 Gas Oil; EN 116, *(for details see page 150).*
99852-0	MULTI-TEST VERIFICATION MATERIAL, ASTM D97 - IP 15 Fuel Oil, (for details see page 151).
99853-0	MULTI-TEST VERIFICATION MATERIAL, ASTM D97 - IP 15 Lubricating Oil, *(for details see page 151).*
99908-0	BIO MULTI-TEST VERIFICATION MATERIAL, Gas Oil, *(for details see page 151).*

SPECIFICATIONS

Temperature Range:	9° to -69°C
Test Positions:	4
Size (HxWxD):	17 x 32 x 18cm
Weight:	4.3kg

FREEZING POINT

99000-2 COLD FILTER PLUGGING POINT (CFPP) APPARATUS

ASTM D6371; IP 309; BS 2000 Part 309; BS 6188; EN 116; NF 116

- Determines low-temperature flow characteristics of diesel fuels, gas oils and other distillate fuels
- Compatible with fuels containing flow improving additives

Comprises a 4 litre dry ice bath (Dewar Flask) and a CFPP test insert connected via a three way cock to a U tube manometer and two 5 litre pressure equalising vessels.

SUPPLIED WITH: interconnecting tubing.

99000-2 (Stand not included)

BIO-FUEL TESTING

CALIBRATION & VERIFICATION MATERIALS

ACCESSORIES – CFPP Apparatus

REQUIRED

THERMOMETERS:

ASTM5C/IP1C or ASTM5F/IP1F or ASTM6C/IP2C or ASTM6F/IP2F

Note: Two thermometers are required for IP 309

14030-2 AIR PUMP, *(for details see page 136).*

70220-3 PORTABLE DRY ICE MAKER MODEL B, produces one 1kg (2.2lb) block in approximately 1 minute *(for details see page 53).*

CALIBRATION, VERIFICATION & TRAINING

99851-0 MULTI-TEST VERIFICATION MATERIAL, ASTM D6371; IP 309 Gas Oil; EN 116, *(for details see page 150).*

99908-0 BIO-FUEL MULTI-TEST VERIFICATION MATERIAL (*for details see page 151*)

SPECIFICATIONS

Weight:	6kg

94000-2 COLD FILTER PLUGGING POINT (CFPP) BATH

ASTM D6371; IP 309; BS 2000 Part 309; BS 6188; EN 116; NF 116

- Digital temperature control
- Accepts 3 CFPP tubes

Consists of a stainless steel bath with integral thermostatic temperature controller and circulator for enhanced control and stability at sub-ambient temperatures. An internal removable rack can accommodate 3 cold filter plugging point (CFPP) inserts.

SUPPLIED WITH: mains lead and instruction manual.

Note: Due to the low operating temperature of this bath it is recommended that it is filled with Butyl Glycol.

BIO-FUEL TESTING

CALIBRATION & VERIFICATION MATERIALS

94000-2

ACCESSORIES – CFPP Bath

REQUIRED

99005-0 COLD FILTER PLUGGING POINT (CFPP) INSERT, comprises a CFPP test insert, two 5 litre pressure equalising vessels, three way cock, manometer and tubing.

THERMOMETERS:

ASTM5C/IP1C or ASTM5F/IP1F or ASTM6C/IP2C or ASTM6F/IP2F

Note: Two thermometers are required for IP 309.

OPTIONAL

14030-2 AIR PUMP, *(for details see page 136).*

CALIBRATION, VERIFICATION & TRAINING

99851-0 MULTI-TEST VERIFICATION MATERIAL, ASTM D6371; IP 309 Gas Oil; EN 116, *(for details see page 150).*

99908-0 BIO MULTI-TEST VERIFICATION MATERIAL, Gas Oil, (*for details see page 151*).

SPECIFICATIONS

Temperature Range:	-47°C to 100°C
Display Resolution:	0.1°C
Temperature Stability:	±0.02°C
Bath Capacity:	12 Litres
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Power:	2.4kW
Size (HxWxD):	55 x 74 x 61cm
Weight:	54kg

FREEZING POINT

16990-2 SETA FREEZING POINT APPARATUS

ASTM D2386; IP 16; ISO 3013; NF M07-048; FTMS 791 1411; JIS K2276

- Detects solid hydrocarbon crystals
- Reference method

Comprises sample tube, paddle, unsilvered flask, cork stopper/ thermometer support, and an insulated metal case with a viewing slot.

CALIBRATION & VERIFICATION MATERIALS

ACCESSORIES – Freezing Point Apparatus

REQUIRED

16992-0 MOISTURE PROOF COLLAR A, type A (Nitrogen)
OR
16993-0 MOISTURE PROOF COLLAR B, type B (Dehydrating)
THERMOMETERS:
ASTM114C/IP14C

OPTIONAL

24500-0 SETA STEEL STAND, with steel support mast.
24680-2 SETA RECIPROCATING STIRRER, with adjustable stroke.
Voltage: 110/120V, 60Hz
220/240V, 50Hz
70210-0 SNOWPACK MAJOR DRY ICE MAKER

CALIBRATION, VERIFICATION & TRAINING

99850-0 MULTI-TEST VERIFICATION MATERIAL, ASTM D2386 - IP 16 Kerosine
(for details see page 150)

SPECIFICATIONS	
Size (HxWxD):	50 x 25 x 25cm
Weight:	3.5kg

Typical Freezing Point setup

CO_2 DRY ICE MAKERS

70200-0 SNOWPACK DRY ICE MAKER

70210-0 SNOWPACK MAJOR DRY ICE MAKER

70220-3 PORTABLE DRY ICE MAKER MODEL B

- Rapid production of consistently sized blocks/pellets
- Connects directly to liquid CO_2 syphon type (dip tube) cylinders

Dry ice/liquid mixtures can produce temperatures down to -78°C. The latent heat of vaporization of dry ice is 572 kJ/kg (246 BTU per lb). Seta dry ice makers are a safe, efficient and convenient method of producing pellets and blocks in a range of sizes.

70220-3

SUPPLIED WITH: pressure hose, and gauge.

SPECIFICATIONS			
Seta Part No:	70200-0	70210-0	70220-3
Pellet/Block size (approx):	30g (1oz)	500g (1.1lb)	1kg (2.2lb)
Injection Time (approx):	1 minute	2½ minute	1 minute
Size (HxWxD):	27 x 15 x 9cm	28 x 15 x 15cm	23 x 15 x 12cm
Weight:	0.6kg	0.8kg	3.3kg

70210-0

21000 SERIES RING AND BALL TEST UNITS

The 21000 Series provides simple equipment to determine the softening point of a sample using the ring and ball method. A steel ball is placed upon a disc of sample contained within a metal ring. The assembly is heated in a bath, and the temperature taken when the sample softens enough to allow the ball to fall through the ring.

CALIBRATION & VERIFICATION MATERIALS

21001-2 RING AND BALL TEST UNIT

ASTM D36; IP 58; EN 1427; BS 76; BS 2000 Part 58; BS 6043 Part 1; ISO 5940; NF T66-008 (obs); STPTC Pt 3

- Two ring holder
- Rectangular base plate

21002-2 RING AND BALL TEST UNIT

ASTM D36; IP 58; EN 1427; BS 76; BS 2000 Part 58; BS 6043 Part 1; ISO 5940; NF T66-008 (obs); STPTC Pt 3

- Four ring holder
- Circular base plate

21003-2 RING AND BALL TEST UNIT

ASTM E28; IP 58; EN 1427

- Two ring holder
- Spectacle shaped base plate

Typical Softening Point setup

ACCESSORIES - 21000 Series Ring & Ball Test Units

REQUIRED

Refer to the table of "ITEMS REQUIRED FOR EACH TEST" and select from the following options:

21170-0 BEAKER, 800ml, borosilicate glass, for two and four-test units.
24500-0 SETA STEEL STAND, and rod, to support 24600-0.
24600-0 UNIVERSAL STIRRER, (for details see page 142).
24640-0 STIRRER ROTOR, for 24600-0, stainless steel.
25000-3 SETA-HOT, 1000W electric heater, variable heat control (for details see page 137).
25300-0 MOULDING PLATE, accepts two rings.
99100-2 ANALYTICAL BALANCE, (for details see page 141).

RINGS and BALLS

Refer to the table of "ITEMS REQUIRED FOR EACH TEST" and select from the following options:

21140-0 SHOULDERED RING, 15 inch wire stem, pack of 3.
21141-2 SHOULDERED RING, pack of 10.
21142-0 STRAIGHT RING, pack of 10.
21143-0 TAPERED RING, pack of 10.
21144-0 BALL, 9.525mm diameter, 3.5 ±0.05g, pack of 30.
21160-3 BALL CENTRING GUIDE, pack of 3.

THERMOMETERS

Refer to the table of "ITEMS REQUIRED FOR EACH TEST"

CALIBRATION, VERIFICATION & TRAINING

99856-0 SETA MULTI TEST VERIFICATION MATERIAL, IP 58 Bitumen (for details see page 151).

ITEMS REQUIRED FOR EACH TEST

Seta No	E28	D36	IP 58; EN1427	BS 76	STPTC Pt 3
21001-2 or 21002-2		●	●	●	●
21003-2	●		●		
21140-0	●				
21141-2	●	●	●		
21142-0			●		
21143-0				●	●
21144-0	●	●	●	●	●
21160-3	●	●	●		
21170-0	●	●	●	●	●
24500-0	●	●	●		●
24600-0	●	●	●		●
24640-0	●	●	●		●
25000-3	●	●	●		●
25300-0				●	●
99100-2	●	●	●	●	●
99856-0 (Calibration)			●		
Thermometers					
ASTM15C/IP60C	●	●	●		
ASTM16C/IP61C	●	●	●	●	
ASTM15F	●	●			
ASTM16F	●	●			
STPTC T3d					●
STPTC T9d					●

DROP POINT APPARATUS

11600-0 PETROLATUM DROP POINT APPARATUS

IP 31 (obs); IP 371; BS 894

A 600ml glass liquid bath with cover, retort stand clamp and thermometer cork, a glass air bath with thermometer cork and air bath thermometer assemblies for IP tests. BS894 assemblies are available as accessories.

Air bath thermometer assemblies comprise a thermometer cemented to a sleeve, a case that screws onto the sleeve and a chromium plated brass cup that clips onto the sleeve.

SUPPLIED WITH: air bath thermometer assembly.

11610-0 PHARMACOPOEIA DROP POINT APPARATUS

Euro. Pharm. 2003 Method III, Test A

Comprises a 1litre borosilicate glass bath complete with cover, retort stand mounting clamp and thermometer cork, a borosilicate glass test tube air bath with a grooved thermometer cork, and an air bath thermometer assembly.

The air bath thermometer assembly comprises a thermometer cemented to a sleeve, a case that screws onto the sleeve and a chromium plated brass cup that clips onto the sleeve.

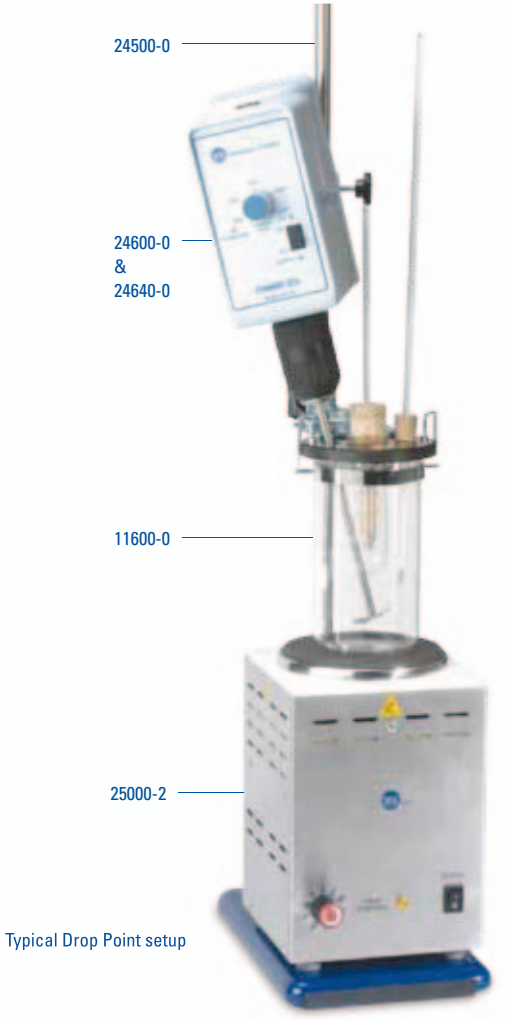
SUPPLIED WITH: air bath thermometer assembly.

11700-0 LUBRICATING GREASE DROP POINT APPARATUS

ASTM D566; IP 132; DIN 51 801; ISO 2176; NF T60-102; FTM 791 1421; JIS K2220

Comprises a 600ml borosilicate glass bath complete with cover, retort stand mounting clamp and thermometer cork, a borosilicate glass test tube air bath with thermometer cork, a thermometer guide cork, 1.5mm dia cup support rod and a chromium plated brass sample cup.

CALIBRATION & VERIFICATION MATERIALS



Typical Drop Point setup

11600-003

CONSUMABLES – Drop Point Apparatus

2 Years/2000 Tests - 11600-0 only		Qty
10200-005	BEAKER, spoutless, 600ml, pack of 5	1
11600-001	CUP, brass, pack of 5	1
11600-003	IP140C THERMOMETER, SLEEVE & CASE	1
11600-004	IP141C THERMOMETER, SLEEVE & CASE	1
11600-005	BOILING TUBE, pack of 10	1
2 Years/2000 Tests - 11610-0 only		**Qty**
11610-001	THERMOMETER, SLEEVE & CASE	1
11610-002	CUP, brass, pack of 5	1
11610-003	BEAKER, spoutless, litre, pack of 5	1
11610-004	BOILING TUBE, pack of 10	1
2 Years/2000 Tests -11700-0 only		**Qty**
10200-005	BEAKER, spoutless, 600ml, pack of 5	1
11700-001	CUP, brass, pack of 5	1
11700-002	TEST TUBE & ROD, pack of 10	1

ACCESSORIES – Drop Point Apparatus

REQUIRED

24500-0	SETA STEEL STAND, and rod, to support 24600-0.
24600-0	UNIVERSAL STIRRER, *(for details see page 142).*
24640-0	STIRRER ROTOR, for 24600-0, stainless steel.
25000-3	SETA-HOT, 1000W electric heater, variable heat control *(for details see page 137).*

REQUIRED - 11600-0 only

THERMOMETERS

ASTM7C/IP5C *(for the water bath).*

REQUIRED - 11610-0 only

THERMOMETERS

ASTM1C *(for the water bath).*

REQUIRED - 11700-0 only

11750-0	SETA THERMOMETER DEPTH GAUGE

THERMOMETERS

ASTM2C/IP62C or ASTM2F/IP62F

Note: Two thermometers are required.

CALIBRATION, VERIFICATION & TRAINING (11700-0 only)

11760-0	SETA CUP PLUG GAUGE, to check dimensions of Grease Cup.
11770-0	SETA GO-NOT-GO CUP GAUGE, to check dimensions of Grease Cup orifice.

OPTIONAL FOR 11600-0

THERMOMETERS

11602-0	BS894 THERMOMETER, SLEEVE & CASE, 20 to 120°C.
11604-0	BS894 THERMOMETER, SLEEVE & CASE, 100 to 230°C.

DROP POINT

11730-2 SETA GREASE DROP POINT OVEN

ASTM D2265; ISO 6299

- Aluminium solid block oven
- Six test apertures
- Temperature range 120 to 345°C
- Illuminated chambers

The 11730-2 oven is heated by an integral 775W temperature controlled cartridge heater. The oven contains six apertures to receive Seta 11740-0 grease cups and support assemblies.

The chambers are illuminated from the rear to provide a clear view of the sample.

CALIBRATION & VERIFICATION MATERIALS

11730-2

ACCESSORIES – Grease Drop Point Oven

REQUIRED

11740-0	SETA GREASE CUP AND SUPPORT ASSEMBLY, comprises; borosilicate glass test tube, sample cup and support, 1.5mm metal rod, thermometer clamp with bushings and support rings.

Note: Up to six assemblies can be used at a time in the Seta 11730-2 oven.

11750-0	SETA THERMOMETER DEPTH GAUGE

THERMOMETERS

ASTM3C or ASTM3F

Note: 1 required for each grease cup and 1 required for the 11730-2 oven.

CALIBRATION, VERIFICATION & TRAINING

11760-0	SETA CUP PLUG GAUGE, to check dimensions of Grease Cup are to specification.
11770-0	SETA GO-NOT-GO CUP GAUGE, to check dimensions of cup orifice are to specification.

CONSUMABLES – Grease Drop Point Oven

2 Years / 2000 Tests		Qty
11730-002	LAMP, 130V, pack of 5	1
11730-204	THERMOCOUPLE, pack of 10	1
11740-001	TEST TUBE & ROD, pack of 10	1

SPECIFICATIONS

Power Supply:	110/120V, 50/60Hz 220/240V, 50/60Hz
Power:	800W
Size (HxWxD):	36 x 23 x 22cm
Weight:	11.2kg

MELTING POINT

21400-0 MELTING POINT APPARATUS

ASTM D87; IP 55; BS 4695; ISO 3841; FTM 791 1402; NF T60-114; JIS K2253

- Cooling curve of petroleum waxes

As a sample of molten petroleum wax cools, the falling temperature will stabilise while the wax solidifies. This is the melting point determined by the cooling curve.

Comprises a test tube, marked with a filling line, mounted in an air bath, contained within a water bath assembly.

ACCESSORIES – Melting Point Apparatus

REQUIRED

THERMOMETERS

Melting Point: ASTM14C/IP17C or ASTM14F/IP17F
Bath: ASTM34C/IP21C

SPECIFICATIONS

Size (HxWxD):	16 x 13 x 13cm
Weight:	1.5kg

21400-0
(Thermometers supplied separately)

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17000 SERIES PENETROMETERS

ASTM D5; D217; D937; D1403; D1321; D1831; D2884; IP 49; IP 50; IP 179; IP 310; IP 376; BS 1377; BS 2000 Parts 49, 50, & 179; BS 2499 Part 3; EN 1426; ISO 2137; DIN 51 579; DIN 51 580; NF T60-119; NF T60-132; NF T60-140; NF T66-004; JIS K2220

17500-0 SETAMATIC PENETROMETER

- Microprocessor controlled
- Penetration range 0 to 700 Pen (70mm)
- Timer range 1 to 9999 seconds
- Automatic plunger release and retention
- Flexi light
- RS232C interface

The 17500-0 Setamatic Penetrometer is a microprocessor-controlled instrument with a range of 0 to 70mm (700 Pen). Plunger release and retention is automatic and results are shown on the digital display in either millimetres or 'pen' units. Soak and penetration times may be set from 0 to 9999 seconds. An RS232C interface is provided for connection to a personal computer.

The machined aluminium base is fitted with a flexible light with dimmer switch, and a spirit level. The counterbalanced head has a geared two-speed raising and lowering mechanism, and contains the control circuits, keypad and fluorescent display. The head may be rotated through 180°.

SUPPLIED WITH: 47.5g plunger, 50g and 100g plunger weights, mains lead and instruction manual.

CALIBRATION & VERIFICATION MATERIALS

SETAPLUS EXTENDED WARRANTY AVAILABLE

17500-0
(Cone and container supplied separately)

SPECIFICATIONS	
Penetration Range:	0 to 700 Pen (70mm)
Penetration Time:	1 to 9999 seconds, fully variable
Retention/Release:	Automatic
Display:	4 Digit, Fluorescent
Voltage:	110/120V or 220/240V, 50/60Hz (switchable)
Power:	40W
Size (HxWxD):	59 x 30 x 33cm
Weight:	12.5kg

17190-2 SETA UNIVERSAL PENETROMETER WITH INTEGRAL CONTROLLER

- Penetration range 0 to 400 Pen (40mm)
- 5, 8, 10, 12, 30 and 60 second timer settings
- Solid state timer
- Automatic plunger release and retention
- Flexi light

A semi-automatic penetrometer with a range of 0 to 40mm (400 Pen). Plunger release and retention is controlled by a solid state timer which can be set for penetration times of 5, 8, 10, 12, 30 and 60 seconds.

The head is fitted with a two speed elevating mechanism for quick and precise positioning of the penetration tip. Penetration is shown on a 150mm dial, graduated 400 x 0.1mm increments, equipped with a slipping clutch pointer.

The machined aluminium base is fitted with a flexible light with dimmer switch, and a spirit level.

SUPPLIED WITH: 47.5g plunger, 50g and 100g plunger weights, mains lead and instruction manual.

CALIBRATION & VERIFICATION MATERIALS

SETAPLUS EXTENDED WARRANTY AVAILABLE

17190-2
(Cone and container supplied separately)

SPECIFICATIONS	
Penetration Range:	0 to 400 Pen (40mm)
Penetration Time:	5, 8, 10, 12, 30, 60 seconds, selectable
Retention/Release:	Automatic
Display:	150mm dial, 400 x 0.1mm increments
Voltage:	110/120V or 220/240V, 50/60Hz (switchable)
Power:	45W
Size (HxWxD):	67 x 30 x 33cm
Weight:	9kg

17000-2 SETA UNIVERSAL PENETROMETER

- Penetration range 0 to 400 Pen (40mm)

A manual penetrometer with a range of 0 to 40mm (400 Pen).

The head is fitted with a two speed elevating mechanism for quick and precise positioning of the penetration tip. Penetration is shown on a 150mm dial, graduated 400 x 0.1mm increments, equipped with a slipping clutch pointer.

The machined aluminium base has an integral spirit level.

SUPPLIED WITH: 47.5g plunger, 50g and 100g plunger weights, and instruction manual.

CALIBRATION & VERIFICATION MATERIALS

SETAPLUS EXTENDED WARRANTY AVAILABLE

SPECIFICATIONS	
Penetration Range:	0 to 400 Pen (40mm)
Retention/Release:	Manual
Display:	150mm dial, 400 x 0.1mm increments
Size (HxWxD):	67 x 30 x 33cm
Weight:	7kg

17000-2
(Cone and container supplied separately)

ACCESSORIES – 17000 Series Penetrometers

REQUIRED		17500-0	17190-3	17000-2
PENETRATION CONES, NEEDLES, PLUNGERS and KITS Either refer to the table to select the individual items required for a test method, or select an appropriate Penetration Kit				
OPTIONAL				
18580-0	ASTM D5 - IP 49 STARTER KIT, comprises pack of 3 needles, 10 bitumen containers and a transfer dish.	●	●	●
17120-0	SETA MIRROR AND CLAMP, assists in positioning penetration devices over the sample surface.		●	●
18200-5	SETA WATER BATH, *(for details see page 61).*	●	●	●
22750-2	DIGITAL STOPWATCH, *(for details see page 141).*			●
CALIBRATION, VERIFICATION & TRAINING				
17150-0	PENETROMETER CALIBRATION KIT, with UKAS Certification, *(for details see page 149).*	●	●	●
99856-0	MULTI TEST VERIFICATION MATERIAL, IP49, Bitumen, (*for details see page 151*).	●	●	●

ITEMS REQUIRED FOR EACH TEST						
	ASTM D5	**ASTM D217**	**ASTM D937**	**ASTM D1321**	**ASTM D1403**	**ASTM D1831**
Needles, Cones & Plungers	18500-0, 18510-0 or 18512-0 or 18520-0	18140-0 or 18000-0	18000-0	18490-0	17910-0 + 17950-0 or 18060-0 +17380-0	17910-0 + 17950-0 or 18060-0 +17380-0
Sample Container	18470-0 or 18530-0	see Grease Workers	18120-0	18480-0 & 18481-0	see Grease Workers	see Grease Workers
Transfer Dish	18550-0					
Grease Worker		17510-0, 17620-0, or 17790-0			17850-0 or 17920-0	17850-0 or 17920-0
Overflow Ring		17520-0				
Grease Cutter		18150-0				
Bath	18200-5	18200-5	18200-5	18200-5	18200-5	18200-5
Thermometer	ASTM17C, 63C or 64C		IP38C	ASTM64C		
Roll Stability Tester						19400-3
Note: for ASTM D5 tests, Starter Kit 18580-0 contains three 18520-3 Needles, ten 18530-0 Containers and one 18550-0 Transfer Dish						

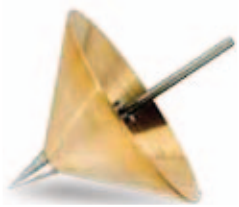
PENETRATOR KITS

- Kits of needles/cones, containers, weights and plungers for specific tests/samples
- Compatible with 0.375 inch (9.53mm) plunger diameter penetrometers and SETA 17000 Series

18101-0

SETA PART	METHOD	EQUIPMENT	APPLICATIONS
18101-0 Penetrator Kit No. 1	ASTM D5; IP 49; DIN 1995; DIN 52 010	Plunger (47.5g); weight (50g); 50 containers; transfer dish; 3 standard bitumen needles	Bituminous materials; confectionery; cosmetics; soap; yeast; chocolate; lipstick; compact powders
18102-0 Penetrator Kit No. 2	ASTM Micro	Micro cone (5g); Plunger (15g); Micro grease container (3 part)	Lubricants; solid or semi-solid pharmaceutical/cosmetic creams
18103-0 Penetrator Kit No. 3	Klein Micro	Micro cone (7g); Plunger (16.8g); Micro grease container (3 part)	Lubricants; solid or semi-solid pharmaceutical/cosmetic creams
18104-0 Penetrator Kit No. 4	ASTM Tapered Hole Disc	Plunger (47.5g); fat/grease sample container; ASTM perforated disc penetrator (102.5g)	Semi-liquid greases/creams; jams; fruit purees; mustards; ketchup; paints; varnishes; printing inks; lacquers
18105-0 Penetrator Kit No. 5	Pin needle	Plunger (15g); weight (2g); 3 brass pin needles; 3 stainless steel pin needles	Putty; fruit; viscous pastes; cheese
18106-0 Penetrator Kit No. 6	Cone tipped cylinder	Plunger (15g); 2 cone-tipped cylinders (15g and 35g)	Toothpaste; soft pastes; printing inks
18107-0 Penetrator Kit No. 7	AOSC Standard Cc 16-60	Plunger (47g); AOSC 20° aluminium cone (45g)	Confectionery; edible fats (butter, margarine); solid emulsions
18108-0 Penetrator Kit No. 8	Unilever	Plunger (47.5g); weight (80g); 40° aluminium cone (31.5g)	Confectionery; edible fats (butter, margarine); solid emulsions
18109-0 Penetrator Kit No. 9	Tapered Hole Disc	Plunger (15g); 3 weights (5g, 10g amd 20g); tapered perforated disc (19.5g)	Mayonnaise; mustard; semi-liquid fats; rubber solutions
18110-0 Penetrator Kit No. 10	Penetration rod	Plunger (47.5g); penetration rod, 6.3mm diameter (6.4g)	Silicone rubber

PENETRATION CONES



18000-0

18140-0

ASTM D217; D937; D1403; IP 50; IP 179; IP 310; BS 2000 Parts 50 &179; ISO 2137; DIN 51 580; DIN 51 804 (obs); NF T60-119 (unless otherwise stated)

- 3.17mm (1/8 inch) stem diameter

SETA PART	BODY	MASS	NOTES
18140-0 SETA ASTM-IP Standard Cone	Acetyl; Solid; Conical	102.5g ±0.05g	
18051-0 SETA ASTM-IP Standard Cone	Acetyl; Solid; Conical	102.5g ±0.05g	CONFORMANCE CERTIFICATE (UKAS) IP 50 only
18000-0 SETA ASTM-IP Optional Cone	Brass; Hollow; Conical	102.5g ±0.05g	
18050-0 SETA ASTM-IP Optional Cone	Brass; Hollow; Conical	102.5g ±0.05g	CONFORMANCE CERTIFICATE (UKAS) IP 50 only
17910-0 SETA Quarter-Scale Cone	Plastic; Conical	3g ±0.025g	Use with Ultra Light-Weight Plunger 17950-0
18060-0 SETA Half-Scale Cone	Brass; Conical	22.5g ±0.025g	Use with Light-Weight Plunger 17380-0
18080-0 SETA Special Full-Scale Cone	Aluminium; Conical	29.8g ±0.05g	

PENETRATION NEEDLES

18510-0

ASTM D5; IP 49; BS 2000 Part 49; DIN 52 010; EN 1426; NF T66-004 (unless otherwise stated)

- 3.17mm (1/8 inch) stem diameter

SETA PART	MASS	NOTES
18520-0 SETA Standard Penetration Needle	2.5g	Pack of 3
18510-0 SETA Standard Penetration Needle	2.5g	CONFORMANCE CERTIFICATE (UKAS) IP 49/EN 1426 only
18512-0 SETA Standard Penetration Needle	2.5g	CONFORMANCE CERTIFICATE (UKAS) ASTM D5
18500-0 SETA Penetration Needle	2.5g	For penetrations between 350 & 500, pack of 3
18490-0 SETA Wax Penetration Needle	2.5g	ASTM D1321; IP 376; DIN 51 579
18492-0 SETA Wax Penetration Needle	2.5g	CONFORMANCE CERTIFICATE (UKAS)

PLUNGERS

17950-0 & 17910-0

ASTM D1403; IP 310; DIN 51 804; ISO 2137

SETA PART	MASS	NOTES
17380-0 SETA Light-Weight Plunger	15g ±0.025g	Use with 18060-0 Half-Scale Cone
17950-0 SETA Ultra Light-Weight Plunger	6.38g ±0.025g	Use with 17910-0 Quarter-Scale Cone

SAMPLE CONTAINERS & DISHES

18550-0

18540-0 18530-0

SETA PART	DESCRIPTION	METHOD
18120-0 SETA Sample Container (Petrolatum)	Brass; 102mm dia; 65mm deep; water-tight lid; cylindrical with flat bottom	ASTM D937; IP 179; BS 2000 Part 179; DIN 51 580; ISO 2137; FTMS 791 312
18470-0 SETA Sample Container (Bitumen)	For penetrations 200 and 350; 69mm dia; 46mm deep; pack of 50	ASTM D5; IP 49; BS 2000 Part 49; EN 1426
18530-0 SETA Sample Container (Bitumen)	For penetrations below 200; 55mm dia; 35mm deep; pack of 50	ASTM D5; IP 49; BS 2000 Part 49
18535-0 SETA Sample Container (Bitumen)	For penetrations below 40; 33-50mm dia; 8-16mm deep; pack of 1000	ASTM D5
18540-0 SETA Sample Container (IP 49)	For penetrations 200 and 350; 55mm dia; 55mm deep; pack of 50	ASTM D5; IP 49; BS 2000 Part 49
18570-0 SETA Slip Cover (for 18530-0)	For use with 18530-0	ASTM D5; IP 49; BS 2000 Part 49
18550-0 SETA Transfer Dish	Copper; for transferring containers from water bath to penetrometer; pack of 2	ASTM D5; IP 49; BS 2000 Part 49
18560-0 SETA 4-Way Micro Penetration Cup	For Bitumen; For rapid quality control tests not in compliance with the test methods listed	
18480-0 SETA Test Specimen Container (Wax)	Brass; 25.4mm dia; 31.8mm deep; pack of 2	ASTM D1321; IP 376; DIN 51 579
18481-0 SETA Brass Base Plate (for 18480-0)	Supports two 18480-0 wax containers	ASTM D1321; IP 376; DIN 51 579

WATER BATHS

18200-5 SETA WATER BATH

18200-5

- Wide range of applications
- 18 litre capacity
- Compact footprint

A small footprint water bath with digital control and a temperature range from ambient +5°C to 100°C.

The control unit/heater unit incorporates a stirrer, and overtemperature and low-level cutouts. Control at near ambient temperatures is obtained by using either the 18203-0 Cooling Unit with Coil or the 18204-0 Cooling Coil shown in Accessories.

The bath is manufactured from stainless steel and is equipped with a stainless steel pent roof lid.

SUPPLIED WITH: perforated draining shelf to support sample containers, mains lead and instruction manual.

ACCESSORIES - Water Bath

OPTIONAL

15650-0	WATER PURIFIER, to minimise scale production. Suitable for domestic water supply, 60l/hr max. flow. Comprises disposable cartridge with capacity for 960L soft water or 180L hard water.
18203-0	COOLING UNIT WITH COIL, chilled recirculating unit which extends the range of the bath to operate at sub-ambient temperatures. **Voltage**: 110/120V, 50/60Hz 220/240V, 50/60Hz
18204-0	COOLING COIL, uses a supply of cooling water to facilitate proper control at ambient or near ambient temperatures.

THERMOMETERS:

ASTM63C; ASTM63F; ASTM64C; ASTM64F; ASTM17C; ASTM17F; IP38C

SPECIFICATIONS

Temperature Range:	Ambient +5°C to 100°C (0°C to 100°C with cooling)
Temperature Stability:	±0.1°C
Capacity:	18 litres
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Power:	1.5kW
Size (HxWxD):	40 x 34 x 36cm
Weight:	10kg

FULL SIZE GREASE WORKERS

ASTM D217; IP 50; ISO 2137; NF T60-132; FTM 791 311; JIS K2220

Note: All Seta Full Size Grease Workers are supplied with brass grease pots and 51 x 1/4inch hole Worker Plates as standard. Stainless steel grease pots (SETA 17525-0) and/or 240 x 1/16inch hole Churn Plates (SETA 17800-002) can be specified at time of ordering.

17790-0 STANOMATIC DUAL GREASE WORKER

- Works two grease pots simultaneously
- Auto-stop at up to 999,999 strokes
- 60 ±10 strokes per minute
- Heavy duty brass grease pot (Stainless Steel option)
- 51 x 1/4 inch hole Worker Plate
- 270 x 1/16 inch hole Churn Plate option
- Large bore cock for thermometer insertion

Two grease working assemblies mounted on a cast aluminium base by dowel pins and quick release cams.

Each grease working assembly comprises a heavy duty grease pot with screw lid. A plunger passes through the lid and is attached to a perforated metal Worker Plate. A large bore grease-cock allows excess air/grease to escape during assembly and insertion of a thermometer.

The plungers are driven by a geared electric motor at 60 ± 10 strokes per minute. An automatic counter will stop the motor after a user-set number of strokes up to a maximum of 999,999. The safety guard incorporates a motor cut-off switch.

SUPPLIED WITH: two grease worker assemblies, mains lead and instruction manual.

SETAPLUS EXTENDED WARRANTY AVAILABLE

17790-0 (Shown with optional Stainless Steel Pots)

SPECIFICATIONS	
Speed:	60 strokes per minute ±10
Worker Plate:	51 x 1/4 inch holes (Optional Churn Plate 270 x 1/16 inch holes)
Grease Pot:	2 x Brass (Optional Stainless Steel)
Voltage:	110/120V, 60Hz 220/240V, 50/60Hz
Power:	450W
Size (HxWxD):	46 x 370 x 50cm
Weight:	38kg

17510-0 SETA MANUAL GREASE WORKER

- Light and medium greases
- Easy grip handle

A grease working assembly identical to those used on the 17790-0 Stanomatic Dual Grease Worker, with a sturdy handle attached to the top of the plunger for manual operation.

17510-0

SPECIFICATIONS	
Worker Plate:	51 x 1/4 inch holes (Optional Churn Plate 270 x 1/16 inch holes)
Grease Pot:	1 x Brass (Optional Stainless Steel)
Size (HxWxD):	32 x 16 x 16cm
Weight:	6kg

ACCESSORIES – Full Size Grease Workers

OPTIONAL

17520-0	SETA OVERFLOW RING, for capturing overflowed grease.
17525-0	STAINLESS STEEL POT, alternative to standard brass pot.
17730-0	SETA DIAL THERMOMETER, bimetal type, range -30° to +60°C.
17740-0	SETA BLANK LID, with lead seal and tommy bar, used when heating.
17800-002	CHURN PLATE, with 270 x 1/16 inch diameter holes, alternative to Worker Plate.
18150-0	SETA CUTTER FOR BLOCK GREASES, comprises a guillotine blade fitted to a wood block, mounted on a cast iron base.
18160-0	SETA CENTRALISING COVER

ROLL STABILITY TESTER

19400-3 SETA ROLL STABILITY TESTER

ASTM D1831; MIL-G-10924

- 10 rev/min and 165 rev/min
- Air bath temperature range ambient to 150°C
- Integral timer
- Four test cylinder capacity

Simulates the effect of squeezing grease between the rollers and the outer race of a roller bearing.

The Seta Roll Stability Tester allows up to four test cylinders to be used simultaneously. Each test cylinder contains a heavy roller and is loaded with a quantity of the sample grease. The test cylinder rests horizontally upon a set of driving and guide wheels which rotate the cylinder at either 10 or 165 rev/min.

A digitally controlled fan assisted air bath is closed over the cylinders to provide evenly distributed heating up to 150°C, and an integral timer is used to set the test duration.

SUPPLIED WITH: mains lead and instruction manual.

Note: Cylinders and Rollers supplied separately.

CALIBRATION & VERIFICATION MATERIALS

SETAPLUS EXTENDED WARRANTY AVAILABLE

19400-3

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ACCESSORIES – Roll Stability Tester

REQUIRED

19401-0	THERMOMETER AND COLLAR ASSEMBLY
19420-0	CYLINDER, mild steel, with threaded end cap and smooth finished interiors.
19430-0	ROLLER, 5kg ±50g, for use in Seta 19420-0 (one required for each cylinder).

OPTIONAL

99100-2	ANALYTICAL BALANCE, (*for details see page 141*).
45001-0	SETAPLUS EXTENDED 12 MONTH WARRANTY

CALIBRATION, VERIFICATION & TRAINING

99927-0	DIGITAL THERMOMETER WITH INTERCHANGEABLE PROBES, (*for details see page 130*).
99960-0	DIGITAL PHOTO TACHOMETER, (*for details see page 147*).

Note: Other items which may be required include: Solvent

SPECIFICATIONS

Capacity:	Up to 4 cylinders
Rotational Speed:	10 or 165 RPM
Temperature Range:	Ambient to 150°C
Voltage:	110/120V, 60Hz 220/240V, 50Hz
Power:	1.4kW
Size (HxWxD):	64 x 64 x 41cm
Weight:	45kg

RõBOT BATH

15200-5 SETA RõBOT BATH

ASTM D2112; D2272; D4742; IP 229

- Ambient to 160°C
- 2 test stations
- Fume extraction
- Gear drive
- Optional automatic pressure monitoring

A floor standing unit used for the evaluation of oxidation stability of new and in-service engine, turbine and insulating oils in the presence of water and a copper catalyst.

Up to two oxidation test vessels (15210-5) are supported at an angle of 30° in an oil bath, and rotated at 100 rev/min by an electric motor and bevel gear drive.

The 72 litre oil bath is digitally temperature controlled. The hinged hood is fitted with a safety interlock that switches off the motor when opened to protect the operator from the rotating test vessels. The bath is equipped with low fluid level and over-temperature protection devices. Extraction fans remove silicone oil vapours and fumes from the bath.

The pressure within a test vessel can be automatically measured and displayed in real time using a Seta AutoRõBOT Pressure Monitoring System (15205-2) or automatically recorded for downloading post-test with a Seta Digi-Corder (15230-2) digital recording manometer.

SUPPLIED WITH: mains leads and instruction manual.

SETAPLUS EXTENDED WARRANTY AVAILABLE

SPECIFICATIONS	
Temperature range:	Ambient to 160°C
Temperature stability:	±0.1°C
Bath capacity:	72 litres
Bath fluid:	Silicone Oil
Number of vessels:	2
Rotational speed:	100 rev/min
Voltage:	220/240V, 50Hz 220/240V, 60Hz
Power:	3.2kW
Size (HxWxD):	113 x 78 x 88cm
Weight:	87kg

15200-5 shown with 15210-5 Oxidation Vessels and 15230-2 Digi-corders installed

15210-5 SETA RõBOT OXIDATION VESSEL

15210-5

ASTM D2112; D2272; D4742; IP 229

- Pressure tested to 5170kPa (750psi)
- Stainless steel construction
- Low rotational vibration

The 15210-5 has been designed to complement the Seta RõBOT Bath. An accurately straight stem and a balance arm opposite the valve ensure smooth rotation when the vessel is installed in a Seta RõBOT Bath.

The oxidation vessel is equipped with a needle valve and a Schrader coupling for charging/discharging, and is threaded to accept various pressure monitoring devices.

CALIBRATION CERTIFICATE (WORKS)

ACCESSORIES - RõBOT BATH

REQUIRED - Bath

11470-0 SILICONE CARBIDE PAPER, 100 grit (FEPA), 280 x 230mm, pack of 50.

15210-5 SETA RÕBOT OXIDATION VESSEL, *(for details see below).*
PRESSURE CERTIFICATE (UKAS)

15460-0 OXYGEN CHARGING AND PURGING KIT, comprises oxygen charging lead and pressure gauge.

16930-0 COPPER CATALYST WIRE, 16 SWG *(for details see page 73).*

OR

16931-0 PREFORMED CATALYST COIL, pre-formed 16930-0 *(for details see page 73).*

OR

16932-0 CATALYST "B", (*for details see page 73*). *Note: for ASTM D4742 only.*

94632-0 SILICONE BATH OIL, 20 litres, for use at temperatures up to 150°C. *Note: 4 required.*

REAL TIME DIGITAL PRESSURE MONITORING

15205-2 SETA AUTORÕBOT PRESSURE MONITORING SYSTEM, *(for details see page 65).*

OR

DIGITAL PRESSURE MONITORING

15230-2 SETA DIGI-CORDER, *(for details see page 65). Note: 1 required for each pressure vessel.*

THERMOMETERS:
ASTM96C or IP37C

REQUIRED - Oxidation Vessel

15211-3 SETA SPANNER AND BENCH PLATE, for oxidation vessel.

15220-0 SETA GLASS LINER AND PTFE COVER, borosilicate glass, with stainless steel springs. *Note: 1 required for each pressure vessel.*

OPTIONAL

15215-0 VESSEL STEM GAUGE, to measure run-out on pressure vessel stem.

15221-0 ACCESSORY KIT, comprises sample container, aluminium disc and cover, with stainless steel springs. *Note: Required for ASTM D2272.*

15240-0 SETA KEY, for removing heater element from bath.

99100-2 ANALYTICAL BALANCE, *(for details see page 141). Note: Required for ASTM D2272.*

CONSUMABLES - RõBOT BATH

2 Years/2000 Tests - Bath	Qty
15200-308 NYLON BEARING, pack of 2	1
2 Years/2000 Tests - Oxidation Vessel	**Qty**
15210-401 'O' RING SEAL, pack of 10	1

RõBOT BATH

15205-2 SETA AUTORõBOT PRESSURE MONITORING SYSTEM

ASTM D2112; D2272; D4742; IP 229

- Automatic pressure monitoring
- Real-time graphical display
- Auto end-point detection
- Simultaneous testing on two vessels
- Pressure range 0 to 1380kPa (0 to 200psi)

For use with the Seta RõBOT Bath 15200-5 to provide two independent channels of automated pressure monitoring and end point detection.

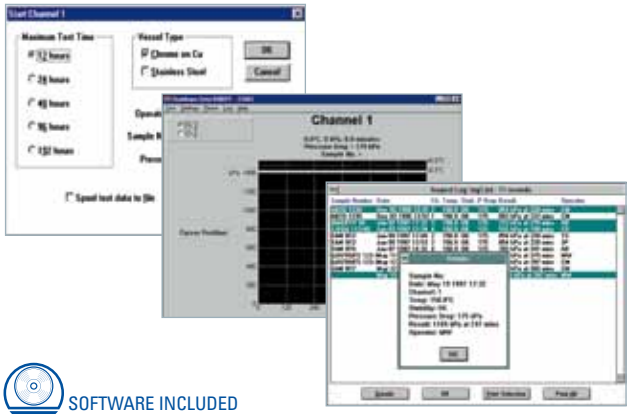
A self powered module and pressure transducer is mounted on each test vessel. Data is transferred between the rotating and static elements by an internal infra red link. Signals from each module are fed into the dual channel pressure monitoring module mounted in the bath cabinet.

The output can be downloaded to an IBM compatible personal computer via the RS232 port, for data logging and to give real time graphical data output. The specially developed Seta RõBOT Software allows a choice of five maximum test durations - 12, 24, 48, 96 and 192 hours.

SUPPLIED WITH: two pressure transducers, connection cable for a pc, adaptor and software.

Note: An IBM compatible personal computer (not supplied) is required.

15205-2 in-situ



SOFTWARE INCLUDED

SPECIFICATIONS	
Measurement range:	0 to 1380kPa (0 to 200psi)
Accuracy:	±1% of full scale

CONSUMABLES - AutoRõBOT Pressure Monitor

2 Years/2000 Tests	Qty
15205-201 LINK LEAD ASSEMBLY	1

15230-2 SETA DIGI-CORDER

ASTM D2112; D2272; D4742; IP 229

- Pressure range 0 to 1380kPa (200psi)
- Selectable recording interval
- Switchable units - kPa, psi, bar
- Memory
- Digital display
- RS232 port

15230-2

The Digi-Corder is a digital recording manometer that can be screwed directly into the top of a 15210-5 Rõbot Oxidation Pressure Vessel.

The manometer can be programmed with the required pressure drop limit as specified in the method of test, and the time interval between measurements. 10 minutes after the pressure drop has been reached (ie, end of test), the manometer will switch off automatically. When turned on again, the manometer will display the results of the last test.

The display shows the current pressure, pressure drop, units of pressure measurement, and elapsed time. The pressure readings at each time interval are automatically stored to the internal memory.

The data and resultant pressure/time diagram can be downloaded via the RS232 port to a personal computer using the supplied software.

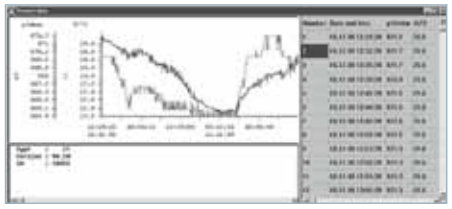
The instrument is housed in a moisture proof case and is powered by a lithium battery, giving approximately 200 days continous use.

SUPPLIED WITH: RS232 cable, instruction manual and software.

Note: An IBM compatible personal computer (not supplied) is required

SOFTWARE INCLUDED

Pair of 15230-2 in-situ



SPECIFICATIONS	
Pressure range:	0 to 1380kPa (0 to 200psi)
Units of measurement:	kPa, psi, bar
Time interval:	00:01 to 59:59 min:sec
Power:	3.6V AA size lithium cell (approx 200 days continuous use)
Size (HxDia):	2.5 x 9cm
Weight:	0.7kg

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OXIDATION STABILITY CONSOLE BATH

15400-4 SETA OXIDATION STABILITY CONSOLE BATH

ASTM D525; D873; IP 40; IP 138; BS 2000 Parts 40 and 138; EN 7536; ISO 7536; NF M07-012; NF M07-013; FTM 791 3352; FTM 791 3354; JIS K2287

- Operating temperature 100°C
- 4 test stations
- Cold-Plunge bath
- Optional automatic pressure monitoring
- Integral vessel oxygen charge system
- Constant water level device

Measures the induction period for oxygen in gasoline, and allows the weight of gum and residue in aviation fuel to be determined by direct weighing.

The Seta Oxidation Stability Console Bath comprises a heated water bath with reflux condenser, a cold water plunge tank for cooling test vessels after each test, and an integral system (including oxygen charging lead) for charging the oxidation vessels prior to test. The bath can accommodate up to four Oxidation Vessels.

Three methods of pressure measurement are available as accessories ranging from a fully automatic pressure monitoring system to oxygen safe pressure gauges.

SUPPLIED WITH: oxygen charging system, mains leads and instruction manual.

SETAPLUS EXTENDED WARRANTY AVAILABLE

15400-4 with a 15450-3 Control Unit and two 15802-0 Oxidation Vessels installed

SPECIFICATIONS	
Bath capacity:	60 litres
Fluid type:	Water
Temperature:	100°C
Max no of Test vessels:	4
Vessel charging:	1380kPa (200psi) maximum
Vessel cooling:	Cold water plunge tank
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Power:	3kW
Size (HxWxD):	135 x 83 x 77cm
Weight:	87kg

15802-0 SETA OXIDATION VESSEL

ASTM D525; D873; IP 40; IP 138; BS 2000 Parts 40 and 138

- Fitted with burst disc assembly
- Pressure tested to 2480kPa (360 psi)

An oxidation pressure vessel with a safety burst disc assembly and discharge tube in accordance with ASTM D525, D873, IP 40 and IP 138.

Comprises a stainless steel vessel with a screw top closure and 'O' ring seal, stem, needle valve, quick connection Schrader male coupling for oxygen charging, and a fitting for pressure monitoring devices.

The stainless steel burst disc will rupture within 10ms at 1530kPa (222psi) ±10% and has a fatigue life of 100,000 cycles to 90% maximum pressure.

PRESSURE CERTIFICATE (WORKS)

15802-0

ACCESSORIES – Oxidation Stability Console Bath

REQUIRED

15802-0 SETA OXIDATION VESSEL, with mandatory burst disc as required by ASTM D525, D873, IP 40 & IP 138, (*for details see below left*).
PRESSURE CERTIFICATE (UKAS)

15803-0 SETA VESSEL CLAMP, to hold vessels during opening and closing, can be bench mounted.

15805-0 SPANNER, for oxidation vessel.

15810-0 SETA LINER, borosilicate glass with cover, pack of 3.

AUTOMATIC PRESSURE MONITORING

15450-3 SETA AUTO OXIDATION CONTROL UNIT, *(for details see page 67).*

OR

ENHANCED ANALOGUE PRESSURE MONITORING

15611-2 PORTABLE CAMBRIDGE PRESSURE RECORDER, *(for details see page 67).*

OR

ANALOGUE PRESSURE MONITORING

15600-0 SETA PRESSURE GAUGE, *(for details see page 67).*

THERMOMETERS:
ASTM22C/IP24C or ASTM22F/IP24F

Note: Other items which may be required include: Solvents, Filtering crucible, Oxygen.

OPTIONAL

15650-0 WATER PURIFIER, to minimise scale production. Suitable for domestic water supply, 60l/hr max. flow. Comprises disposable cartridge with capacity for 960 litre soft water or 180 litre hard water.

15800-4 SETA OXI-FEED PRESSURE VESSEL, a 15802-0 pressure vessel without a burst disc or discharge tube.
PRESSURE CERTIFICATE (UKAS)

99100-2 ANALYTICAL BALANCE, (*for details see page 141). Note: required for tests to D873.*

99200-2 LABORATORY OVEN, *(for details see page 137).*

PRESSURE MONITORING OPTIONS (ITEMS REQUIRED)				
Seta Part No.	**1 Vessel**	**2 Vessels**	**3 Vessels**	**4 Vessels**
AUTOMATIC PRESSURE MONITORING				
15450-3 Seta Auto Oxidation Control Unit	1	1	1	1
ENHANCED ANALOGUE PRESSURE MONITORING				
15611-2 Portable Cambridge Pressure Recorder	1	1	2	2
ANALOGUE PRESSURE MONITORING				
15600-0 Seta Pressure Gauge	1	2	3	4

OXIDATION STABILITY CONSOLE BATH

15450-3 SETA AUTO OXIDATION CONTROL UNIT

- Simultaneous measurement of 4 test vessels
- Automatic end-point detection
- Simple two point calibration facility

An automatic pressure monitoring system designed to be used with 15802-0 oxidation vessels and to match the 15400-5 bath, but can be used with other suitable baths.

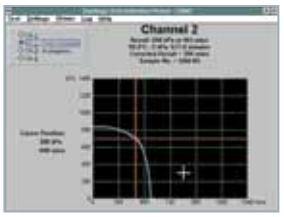
Comprises two digital pressure monitors (each capable of monitoring two vessels) with a membrane switch control panel. The unit can also be used to display oxygen pressure whilst charging vessels.

The control unit, when connected to a computer via the DB25 port and using the Seta OXS Software (supplied), allows automatic end point detection, induction period determination, data logging, and graphical/ printed output functions. The maximum run time may be selected as either 24 or 96 hours.

SUPPLIED WITH: DB25 cable, OXS software, mains lead and instruction manual.

Note: An IBM compatible personal computer (not supplied) is required.

15450-3



SOFTWARE INCLUDED

CALIBRATION & VERIFICATION MATERIALS

ACCESSORIES – Auto Oxidation Control Unit

REQUIRED

15455-0	TRANSDUCER, complete with lead. *Note: 1 required for each oxidation vessel.* CALIBRATION CERTIFICATE (WORKS)
15456-0	CALIBRATION PLUG, plugs into transducer input to indicate calibration accuracy of 15450-3.

OPTIONAL

15620-2	SETA OXYGEN CHARGING LEAD, for connecting oxygen supply to oxidation vessel when not using 15400-4 bath.

CALIBRATION, VERIFICATION & TRAINING

80005-2	PRESSURE CALIBRATOR, used to recalibrate pressure monitors, *(for details see page 146).*

SPECIFICATIONS

Measurement range:	0 to 1380kPa (0 to 200psi)
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz (switchable)
Size (HxWxD):	45 x 38 x 19cm
Weight:	12.2kg

15611-2 PORTABLE CAMBRIDGE PRESSURE RECORDER

- Range 550 to 1380kPa (80 to 200psi)
- Simultaneous measurement of 2 test vessels
- Twenty-four hour recording time
- Oxygen safety device

An oxygen safe, 24 hour electrically driven chart recorder for monitoring two oxidation vessels within a range of 550 to 1380kPa (80 to 200psi).

SUPPLIED WITH: 5 red pens, 5 green pens, and pack of 100 charts (kPa).

CALIBRATION CERTIFICATE (WORKS)

ACCESSORIES – Portable Cambridge Pressure Recorder

REQUIRED

15460-0	OXYGEN CHARGING AND PURGING KIT, contains oxygen charging lead and pressure gauge.
15640-0	SETA PRESSURE TRANSMITTING CAPILLARY, for connecting oxidation vessel to 15611-0 Pressure Recorder. *Note: 1 required for each vessel.*

SPECIFICATIONS

Pressure range:	550 to 1380kPa (80 to 200psi)
Pen:	Twin pen
Chart drive:	Synchronous electric motor
Voltage:	110/120V, 60Hz 220/240V, 50Hz/60Hz
Size (HxWxD):	66 x 48 x 38cm
Weight:	11kg

15600-0 SETA PRESSURE GAUGE

- 0 to 1380kPa (0 to 200psi)
- Oxygen safe

75mm diameter, oxygen safe pressure gauge with a 0 to 1 380kPa (0 to 200psi) range. Suitable for use with Seta 15800-4 and 15802-0 Oxidation Vessels.

Note: 1 required for each pressure vessel.

OXIDATION/CORROSION DUAL PURPOSE BATH

15550-2 SETA OXI-COR BATH

ASTM D525; D873; D5304; IP 40; IP 138; BS 2000 Parts 40 and 138; ISO 2160; FTM 791 3352; FTM 791 3354; NF M07-012; NF M07-013; JIS K2276; Acccelerated Shelf Life Test for Dried Pet Food

Also suitable for CORROSION TESTS to: ASTM D130; D4048; D4814 Annex; IP 112; IP 154; IP 227 (obs); IP PM DJ 2005; BS 2000 Parts 112 and 154; DIN 51 811; EN 2160; FTM 791 5325; NF M07-015; JIS K2513

- Ambient to 150°C temperature range
- 3 oxidation test stations
- Oxidation tests including IP 40
- Copper & Silver corrosion tests

A stainless steel water or oil bath with a temperature range of ambient to 150°C, temperature controlled to ±0.1°C by a top mounted thermostir circulator with integral over-temperature and low fluid level protection.

The 15550-2, when used with the relevant accessories, is an economic and versatile bath capable of carrying out oxidation and copper/silver corrosion tests, including IP 40, and ASTM D4814.

The bath can accept up to three oxidation vessels (Seta 15802-0) and accessories are available for three methods of pressure measurement ranging from a fully automatic pressure monitoring system to oxygen safe pressure gauges.

Further details on using the Oxi-Cor as a corrosion bath are shown in the Corrosion & Rust section on page 74.

SUPPLIED WITH: 4 lids, mains lead and instruction manual.

BIO-FUEL TESTING

SPECIFICATIONS

Temperature Range:	Ambient +5 to 150°C
Temperature Stability:	±0.1°C
No of Oxidation Test Stations:	3
Bath Fluid:	Water (to 99°C) or Oil
Bath Capacity:	35 litres
Heater Power:	1500W
Supply Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Size (HxWxD)	41 x 45 x 33cm
Weight:	10kg

ITEMS REQUIRED FOR EACH TEST

Seta Part No.	D525, D873 IP 40, IP 138	D5304
15450-3	▲	
15600-0	▲	▲
15611-2	▲	▲
15802-0	●	
15803-0	●	●
15805-0	●	●
15810-0	●	●
22750-2		
99100-2	●	●
99200-2	●	●
ASTM22C	●	
ASTM61C		●

Items marked ▲ are options for pressure monitoring.

PRESSURE MONITORING OPTIONS (ITEMS REQUIRED)

Seta Part No.	1 Vessel	2 Vessels	3 Vessels
AUTOMATIC PRESSURE MONITORING			
15450-3 Seta Auto Oxidation Control Unit	1	1	1
ENHANCED ANALOGUE PRESSURE MONITORING			
15611-2 Portable Cambridge Pressure Recorder	1	1	2
ANALOGUE PRESSURE MONITORING			
15600-0 Seta Pressure Gauge	1	2	3

15550-2 (Glassware and pressure vessels supplied separately)

ACCESSORIES - Oxi-Cor Bath

REQUIRED

15455-0 TRANSDUCER, complete with lead. *Note: 1 required per oxidation vessel.*
CALIBRATION CERTIFICATE (WORKS)

15620-2 SETA OXYGEN CHARGING LEAD, oxygen supply to oxidation vessel. 1m long, Schrader quick connect couplings, one end male, one end female.

15802-0 SETA OXIDATION VESSEL, with mandatory burst disc as required by ASTM D525, D873, IP 40 & IP 138, *(for details see page 66).*
PRESSURE CERTIFICATE (UKAS)

15803-0 SETA VESSEL CLAMP, to hold vessels during opening and closing. Can be fixed to a bench.

15805-0 SPANNER, for oxidation vessel.

15810-0 SETA LINER, borosilicate glass with cover, pack of 3.

22750-2 DIGITAL STOPWATCH, hand-held, 0.1s resolution, *(for details see page 141).*

94633-0 BATH OIL, 20 litres, for filling bath, for temperatures up to 80°C. *Note: 2 required.*

OR

94635-0 BATH OIL, 20 litres, for filling bath, for temperatures between 80 and 120°C. *Note: 2 required.*

OR

94632-0 SILICONE BATH OIL, 20 litres, for filling bath, for temperatures between 100 and 150°C. *Note: 2 required.*

99100-2 ANALYTICAL BALANCE, for tests to D873, *(for details see page 141).*

99200-2 LABORATORY OVEN, for tests to D873 and IP 138, *(for details see page 137).*

AUTOMATIC PRESSURE MONITORING

15450-3 SETA AUTO OXIDATION CONTROL UNIT, *(for details see page 67).*

OR

ENHANCED ANALOGUE PRESSURE MONITORING

15611-2 PORTABLE CAMBRIDGE PRESSURE RECORDER, *(for details see page 67).*

OR

ANALOGUE PRESSURE MONITORING

15600-0 SETA PRESSURE GAUGE, *(for details see page 67).*
CALIBRATION CERTIFICATE (WORKS)

THERMOMETERS:

ASTM22C/IP24C or ASTM61C/IP63C

OPTIONAL

15650-0 WATER PURIFIER, to minimise scale production.

15800-4 SETA OXI-FEED PRESSURE VESSEL, a 15802-0 pressure vessel without a burst disc or discharge tube.
PRESSURE CERTIFICATE (UKAS)

Note: Other items which may be required include: Oxygen, Forced-air drying oven, Filter Funnel, Hotplate.

SOLID BLOCK OXIDATION BATHS

16670-0 SETA OXI SOLID BLOCK BATH – 4 WAY

ASTM D525; D873; D2274; D4310; ASTM D7462 Oxidation Stability of Biodiesel Blends (B100) and Blends of Biodiesel with Middle Distillate Petroleum Fuel (Accelerated Method); IP 40; IP 138; IP 157; IP 388; BS 2000 Parts 40 and 138; EN 7536; ISO 7536

- 4 position
- Dry block
- Over temperature cut out
- Small footprint

BIO-FUEL TESTING 16670-0

The Seta Oxi Solid Block Bath is an aluminium block bath with digital temperature control that has been designed to accept up to four oxidation vessels for carrying out tests equivalent to the IP 40 test method. Seta Oxidation Vessels (15802-0) are recommended for use with the Seta Oxi Block Baths. Automatic pressure monitoring can be carried out using a Seta Auto Oxidation Unit (15450-3 four channel or 15452-0 six channel). Alternatives are the Portable Cambridge Pressure Recorders (15611-2) or Seta Pressure Gauges (15600-0).

SPECIFICATIONS

Temperature Range:	Ambient +5° to 100°C
Bath Type:	Dry Block
Max No. of Test Vessels:	4
Heat-Up Time to 100°C:	80 mins
Voltage:	220/240V, 50/60Hz
Power Consumption:	3kW max
Size (HxWxD):	30 x 60 x 28cm
Weight:	65kg

PRESSURE MONITORING OPTIONS (ITEMS REQUIRED)

Seta Part No.	1 Vessel	2 Vessels	3 Vessels	4 Vessels
AUTOMATIC PRESSURE MONITORING				
15450-3 Seta Auto Oxidation Control Unit	1	1	1	1
ENHANCED ANALOGUE PRESSURE MONITORING				
15611-2 Portable Cambridge Pressure Recorder	1	1	2	2
ANALOGUE PRESSURE MONITORING				
15600-0 Seta Pressure Gauge	1	2	3	4

ACCESSORIES – Oxi Solid Block Bath

REQUIRED

15802-0 SETA OXIDATION VESSEL, with mandatory burst disc as required by ASTM D525, D873, IP 40 & IP 138, (*for details see page 66*).
PRESSURE CERTIFICATE (UKAS)

15803-0 SETA VESSEL CLAMP, to hold vessels during opening and closing, can be bench mounted.

15805-0 SPANNER, for oxidation vessel.

15810-0 SETA LINER, borosilicate glass with cover, pack of 3.

AUTOMATIC PRESSURE MONITORING

15450-3 SETA AUTO OXIDATION CONTROL UNIT, *(for details see page 67).*

OR

ENHANCED ANALOGUE PRESSURE MONITORING

15611-2 PORTABLE CAMBRIDGE PRESSURE RECORDER, *(for details see page 67).*

OR

ANALOGUE PRESSURE MONITORING

15600-0 SETA PRESSURE GAUGE, *(for details see page 67).*

THERMOMETERS:
ASTM22C/IP24C or ASTM22F/IP24F

Note: Other items which may be required include: Solvents, Filtering crucible, Oxygen.

A 6 POSITION BATH ALSO AVAILABLE (16675-0) – PLEASE CONTACT STANHOPE-SETA FOR DETAILS

NORMA HOFFMAN OXIDATION PRESSURE CYLINDER

16400-3 SETA OXIDATION PRESSURE CYLINDER (NORMA HOFFMAN)

ASTM D942; D1402 (obs); IP 142; BS 2000 Part 142

- Pressure tested to 1860kPa (270psi)

Used to determine the resistance to oxidation of lubricating oil when stored statically in a sealed system with an oxygen atmosphere.

Comprises polished stainless steel cylinder with top closure and lead seal, stem, needle valve and quick connection coupling.

PRESSURE CERTIFICATE (WORKS)

16400-3

ACCESSORIES – Oxidation Pressure Cylinder

REQUIRED

16410-0 SETA DISH-HOLDER, stainless steel, supports five glass dishes.

16420-0 SETA GLASS DISH, borosilicate, pack of 10.

CONSUMABLES – Oxidation Pressure Cylinder

2 Years/2000 Tests - Bath	Qty
15640-001 NEOPRENE WASHER, pack of 50	1
16400-001 LEAD GASKET, pack of 20	1

16450-0 OXYGEN PRESSURE GAUGE NH

- 0 to 1380kPa (0 to 200psi)
- Oxygen safe

An oxygen safe pressure gauge with a range of 0 to 1380kPa (0 to 200psi), 150mm diameter, suitable for use with 16400-3 Norma Hoffman oxidation cylinders.

CALIBRATION CERTIFICATE (WORKS)

SOLID BLOCK OXIDATION BATHS

ASTM D2440; D4636; D4871; D5763; D5846; D6514; IP 48; IP 154; IP 280; IP 306; IP 307; IP 331 (obs); IP 335; EN 61125A, B and C; IEC 61125 Methods A, B and C; BS 2000 Parts 48, 280 and 306; ISO 2160; ISO 7624; DIN 51 811; NF T60-150; JIS K2513

Suitable for heating samples for Copper Strip Tests to ASTM D4048; IP 112; BS 2000 Part 112

A Solid Block Bath alternative to ASTM D130 and IP 154

16600-2 Test Well Positions

16600-2 (Glassware & Flowmeters supplied separately)

16600-2 SETA HIGHTEMP BATH – UNIVERSAL OXIDATION

- Solid block bath
- 50 to 375°C temperature range
- 15 test wells in three sizes
- Up to 6 simultaneous tests

A solid block bath for oxidation and thermal stability tests that allows up to six tests to be carried out simultaneously.

Comprises a solid block bath, flow control unit (flowmeters supplied separately) and a digital temperatue controller. The aluminium solid block bath maintains a set temperature to within ±0.5°C across a range of 50° to 375°C. The top of the bath is insulated by a ceramic pad, and the vacant test wells have removeable ceramic covers. The bath can accept six 27mm oxidation cells, or six 39mm oxidation cells, or three 51mm oxidation cells.

The flow control unit comprises a gas inlet pressure regulator, pressure gauge and mounts for six flowmeters. The digital temperature controller is simple to operate and features an easy-to-read high visibility blue display.

SUPPLIED WITH: flow control unit, digital temperature controller, mains leads and instruction manual.

Note: Flowmeters, glassware and catalysts must be ordered separately.

BIO-FUEL TESTING

SETAPLUS EXTENDED WARRANTY AVAILABLE

SPECIFICATIONS

Seta Part No:	16600-2	16620-2
Temperature Range:	50° to 375°C	50° to 375°C
Temperature Stability:	±0.5°C	±0.5°C
Test Wells:	6 x 27mm 6 x 39mm 3 x 51mm	12 x 27mm
Voltage:	220/240V, 50/60Hz	220/240V, 50/60Hz
Power:	1.2kW	1.2kW
Size (HxWxD) Bath: Flow Control Unit: Temperature Controller:	 48 x 45 x 49cm 44 x 35 x 26cm 26 x 12 x 6cm	 48 x 45 x 49cm 44 x 35 x 26cm (each) 26 x 12 x 6cm
Weight Bath: Flow Control Unit: Temperature Controller:	 90kg 11kg 2kg	 90kg 11kg (each) 2kg

FLOWMETER SPECIFICATIONS

Seta Part No.	Flow Rate l/hr	Conditions	Accuracy
16601-2	0.15 to 2.05	Oxygen @ 0.4 bar (g) and 21°C	±2% full scale
16602-2	0.3 to 3.9	Air @ 0.4 bar (g) and 21°C	±2% full scale
16603-2	0.8 to 10.8	Air @ 0.4 bar (g) and 21°C	±2% full scale
16608-0	1.0 to 17	Air @ 0.4 bar (g) and 21°C	±1% full scale

SOLID BLOCK OXIDATION BATHS

16620-2 SETA HIGHTEMP BATH - 12 WAY

- 12 test wells for 27mm glassware
- Up to 12 simultaneous tests

Similar to the 16600-2 Seta Hightemp bath, the 16620-2 can accept up to twelve 27mm oxidation cells.

The flow control unit is supplemented by a second unit that provides places for a further six flowmeters (supplied separately), thus allowing 12 simultaneous tests.

SUPPLIED WITH: two flow control units, digital temperature controller, mains leads and instruction manual.

Note: Flowmeters, glassware and catalysts must be ordered separately.

BIO-FUEL TESTING

SETAPLUS EXTENDED WARRANTY AVAILABLE

16630-0 SETA HIGHTEMP BATH - 61125 METHOD C

- Supplied with flowmeters

Similar to 16600-2, but supplied with flowmeters for tests to IEC 61125C.

16635-0 SETA HIGHTEMP BATH - 12 WAY - 61125 METHOD C

- Supplied with flowmeters

Similar to 16620-2, but supplied with flowmeters for tests to IEC 61125C.

ACCESSORIES - Hightemp Baths

REQUIRED

Select from the table "ITEMS REQUIRED FOR EACH TEST".

16720-0 GLASSWARE, 27 x 210mm test cell assembly, pack of 6.
Note: *2 sets of glassware are required for 12 test configuration.*

16771-0 GLASSWARE, 39 x 210mm test cell assembly, pack of 6.
Note: 16600-0 only.

16840-0 GLASSWARE, 27 x 300mm test cell assembly, pack of 6.
Note: *2 sets of glassware are required for 12 test configuration.*

16850-0 GLASSWARE, 39 x 300mm test cell assembly, pack of 6.
Note: 16600-0 only.

16860-0 GLASSWARE, 51mm Allihn condensor assembly, pack of 6.
Note: 16600-0 only.

16601-2 FLOWMETER, 1.0 l/hr, oxygen, ±2% fs, set of 6.
CALIBRATION CERTIFICATE (WORKS)

16602-2 FLOWMETER, 3.0 l/hr, air, ±2% fs, set of 6.
CALIBRATION CERTIFICATE (WORKS)

16603-2 FLOWMETER, 5.0 l/hr, air, ±2% fs, set of 6.
CALIBRATION CERTIFICATE (WORKS)

16608-0 FLOWMETER, 15 l/hr, air, ±1% fs, set of 6.
CALIBRATION CERTIFICATE (WORKS)

16610-0 DIGITAL THERMOMETER, with 30 and 100cm thermocouples.

16780-0 IRON CATALYST WIRE, 15m, *(for details see page 73).*

16790-0 COPPER CATALYST WIRE, 15m, *(for details see page 73).*

16919-0 PREFORMED COPPER/STEEL CATALYST COIL, pack of 6, *(for details see page 73).*

16920-0 STEEL CATALYST WIRE, 3m, pack of 6, *(for details see page 73).*

16930-0 COPPER CATALYST WIRE, 3m, pack of 6, *(for details see page 73).*

16791-0 PREFORMED COPPER CATALYST COIL, pack of 6, *(for details see page 73).*

16890-0 5 METAL SPECIMEN SET

16660-0 BUBBLE FLOWMETER

16730-0 BUBBLE FLOWMETER

22750-2 DIGITAL STOPWATCH, hand-held, 0.1s resolution, *(for details see page 141)*

THERMOMETERS:

ASTM9C/IP15C; ASTM40C/IP80C; ASTM41C/IP81C; IP22C

ITEMS REQUIRED FOR EACH TEST

Seta Part No.	IP 48	IP 280 ISO-DIS 7624	IP 306	IP 307 EN 61125A	IP 331	IP 335 EN 61125B	D2440	D4636	D5763	D5846	D6514	EN 61125C
22750-0	●	●	●	●	●	●	●	●	●	●	●	●
GLASSWARE												
16720-0	●	●	●	●		●	●					●
16771-0					●							
16840-0												
16850-0									●	●	●	
16860-0								●				
FLOWMETERS												
16601-2		●	●	●	●	●	●					
16602-2									●	●	●	
16603-2								●				
16608-0	●											
16660-0	●							●				
16730-0		●	●	●	●	●	●		●	●	●	
THERMOMETERS												
16610-0							●	●	●	●	●	
IP22C	●											
ASTM9C/ IP15C		●		●		●						●
ASTM40C/ IP80C				●								●
ASTM41C/ IP81C		●	●		●	●	●		●			●
ASTM41C/ IP81C												
CATALYSTS												
16780-0					●							
16790-0	●		●	●	●	●						●
16791-0							●					
16919-0										●	●	
16920-0										●	●	
16930-0										●	●	
16890-0								●				

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SOLID BLOCK OXIDATION BATHS

16640-0 SETA TOST BATH – 12 WAY

ASTM D943; ASTM D7472 Oxidation Stability of Biodiesel Blends (B100) and Blends of Biodiesel with Middle Distillate Petroleum Fuel (Accelerated Method); IP 157; ISO 4263; DIN 51 587; NF T60-150 (TOST Test)

*** Alternative to ASTM D2274-IP 388 and ISO 12205**

- 12 positions
- Dry block bath
- Ambient to 100°C temperature range
- Integral Setatemp controller
- Seta Oxflo Controller and flowmeters included

A compact solid block bath which can accept up to 12 sets of oxidation glassware and is suitable for TOST tests and as an alternative to liquid filled baths.

The layout of the heating elements give an even temperature distribution and the integral Setatemp 50K Temperature Controller ensures stability over extended test times. Safety features include an over-temperature cut-out.

The Seta Oxflo Controller (supplied) comprises an inlet pressure regulator, pressure gauge and six precision flowmeters with tubes and floats calibrated for oxygen at 3 litres/hour, 21°C and 0.4bar pressure.

SUPPLIED WITH: 6 place Seta Oxflo Controller with gas inlet pressure regulation, pressure gauge and six precision flowmeters calibrated at 3 litres/hr.

Note: For 12 way operation an additional SetaOxflo Controller (16905-2) is required.

16640-0 (Glassware supplied separately)

BIO-FUEL TESTING

CALIBRATION CERTIFICATE (WORKS)

SETAPLUS EXTENDED WARRANTY AVAILABLE

16645-0 SETA TOST BATH – 6 WAY ALSO AVAILABLE, PLEASE CONTACT STANHOPE-SETA FOR DETAILS

ACCESSORIES – TOST & Oxidation Baths

REQUIRED

Select from the table "ITEMS REQUIRED FOR EACH TEST".

11470-0	SILICONE CARBIDE PAPER, 100 grit (FEPA), 28 x 23cm, pack of 50.
16905-2	SETA OXFLO CONTROLLER, 6 way (FOR 16640-0 ONLY) *Note: required for 12 way operation only.*
16910-0	SET OF GLASSWARE, comprises six each condensers, test tubes, delivery tubes and interconnecting tubing.
16914-0	SAMPLE FILTERING KIT, for ASTM D2274 only, comprises filters, filter holder, vacuum flask. and vacuum pump.
16915-0	FILTRATION & ACCESSORY KIT, for ASTM D4310 only, comprises filters, filter holder, weighing bottle, separating funnel, sampling tube, syringe, dessicator, vacuum filtering flask, forceps, and vacuum pump.
16916-0	FILTRATION KIT, for ASTM Draft Method for BioDiesel and BioDiesel Blends, comprises filters, filter holder, vacuum filtering flask, and vacuum pump.
16920-0	STEEL CATALYST WIRE, cut in 3 metre lengths, pack of 6, *(for details see page 73).*
	AND
16930-0	COPPER CATALYST WIRE, cut in 3 metre lengths, pack of 6, *(for details see page 73).*
	OR
16921-0	PREFORMED COPPER/STEEL CATALYST COIL, pack of 6, (*for details see page 73*). *Note: alternative to 16920-0, 16930-0 and 16940-2.*
16950-0	ACCESSORY PACK, for ASTM D943, comprises thermometer bracket, two support rings and six each sampling tube holders, sampling tube spacers, stainless steel sampling tubes with Luer connector, stoppers, oil level indicator strips and 10ml syringes. Excluding thermometer, 16980-0.
16980-0	THERMOMETER (SPECIAL) for ASTM D943, 80°C to 100°C graduated in 0.1°C. Immersion depth 76mm.
25000-3	SETA-HOT, 1000w electric heater with variable heat control, *(for details see page 137).*
94635-0	BATH OIL, 20 litres, for filling bath, for temperatures between 80 and 120C (FOR 16900-5 and 16960-0 ONLY).
99100-2	ANALYTICAL BALANCE, *(for details see page 141).*
99200-2	LABORATORY OVEN, *(for details see page 137).*

THERMOMETER:

ASTM40C/IP80C

Note: Other items which may be required include: Silicone grease, Solvents and acids.

SPECIFICATIONS

Temperature Range:	Ambient to 100°C
Temperature Control at 95°C:	Uniformity: ±0.1°C Stability: ±0.03°C
Bath Type:	Solid Block
Power:	2kW
Voltage:	220/240V, 50/60Hz
Size (HxWxD) **Bath:** **Oxflo Control Unit:**	 50 x 25 x 64cm 44 x 35 x 26cm
Weight **Bath:** **Oxflo Control Unit:**	 110kg 11kg

ITEMS REQUIRED FOR EACH TEST

Seta Part No.	Fuels *ASTM D2274	Fuels ASTM Draft Biodiesel	Oils ASTM D943	Oils ASTM D4310	Oils DIN 51 587
11470-0			●	●	●
16910-0	●	●			●
16914-0	●				
16915-0				●	
16916-0		●			
16920-0			●	●	●
16921-0			●	●	●
16930-0			●	●	●
16950-0			●		
16980-0			●	●	
25000-3	●	●			●
99100-2	●	●		●	●
99200-2	●	●		●	●
ASTM40C/ IP80C	●	●	●	●	●

*Note: *ASTM D2274 specifies the use of a liquid bath.*

OIL FILLED OXIDATION BATHS

16900-5 SETA OXIDATION BATH WITH OXFLO CONTROLLER

ASTM D943; D2274; D4310; ASTM D7462 Oxidation Stability of Biodiesel Blends (B100) and Blends of Biodiesel with Middle Distillate Petroleum Fuel (Accelerated Method); IP 157; IP 388; DIN 51 587; BS 2000 Part 388; ISO 12205; ISO 4263; NF T60-150 (TOST Test); NF M07-047

- 6 position oil bath
- Reliable digital thermostir unit
- Seta Oxflo Controller and flowmeters included
- Low liquid protection
- Over temperature cut out

An oil bath and oxygen flow control unit used for quantative analysis of the tendency of oils and fuels to form sludge, acids and deposits when exposed to oxygen in the presence of metallic catalysts over extended periods.

The 35 litre oil bath can accept up to six sets of glassware. The stirred oil is maintained to within ±0.1°C at 95°C by an integral thermostir unit that has been designed for continuous use over extended periods, incorporating a stirrer motor well recognized for longevity. The temperature measurement system uses a PT1000 probe to ensure long term temperature stability without routine maintenance or re-calibration.

The separate Oxflo control unit includes a gas inlet pressure regulator, pressure gauge and six precision flowmeters calibrated for oxygen at 3 litres/hour, 21°C and 0.4bar pressure.

Safety features include low level liquid protection and over temperature cut outs.

SUPPLIED WITH: Oxflo control unit, six flow meters, mains leads and instruction manual.

Note: Glassware and catalysts must be ordered separately.

16900-5 (Glassware supplied separately)

Note: Glassware and catalysts must be ordered separately.

BIO-FUEL TESTING

CALIBRATION CERTIFICATE (WORKS)

SETAPLUS EXTENDED WARRANTY AVAILABLE

FOR ACCESSORIES SEE PAGE 72

16960-0 SETA OXIDATION BATH WITH OXFLO CONTROLLER

- 6 position oil bath
- Unique light tight (when closed) viewing window

All details are similar to 16900-5 above except that the bath has a unique light tight (when closed) viewing window.

SUPPLIED WITH: Oxflo control unit, six flow meters, mains leads and instruction manual.

Note: Glassware and catalysts must be ordered separately.

BIO-FUEL TESTING

CALIBRATION CERTIFICATE (WORKS)

SETAPLUS EXTENDED WARRANTY AVAILABLE

FOR ACCESSORIES SEE PAGE 72

OXIDATION CATALYSTS

ASTM D943; D2112; D2272; D2440; D4310; D5846; IP 229; IP 306; IP 307; IP 331 (obs); IP 335; BS 148; ISO 4263; DIN 51 587; NF T60-150; IEC 61125 A, B & C

CONFORMANCE CERTIFICATE

- Polished and cleaned prior to winding and encapsulation
- Sealed into a nitrogen filled container with dessicant bag

PRE-FORMED COILS	
16921-0	COPPER/STEEL, pack of 6
16931-0	COPPER, pack of 6
16791-0	COPPER, pack of 6
16919-0	COPPER/STEEL, pack of 6

STANDARD WIRE LENGTHS	
16780-0	IRON, 15m
16790-0	COPPER, 15m
16920-0	STEEL, 3m, pack of 6
16930-0	COPPER, 3m, pack of 6

LIQUID	
16932-0	ASTM CATALYST "B" (METAL NAPHENATE MIXTURE), for ASTM D4742, sufficient for 35 tests

SELECTION GUIDE

METHOD	MATERIAL	PRE-FORMED COILS	STANDARD WIRE LENGTHS
ASTM D943	Copper/Steel	16921-0	16920-0 & 16930-0
ASTM D2112	Copper	16931-0	16930-0
ASTM D2272	Copper	16931-0	16930-0
ASTM D2440	Copper	16791-0	
ASTM D4310	Copper/Steel	16921-0	16920-0 & 16930-0
ASTM D5846	Copper/Steel	16919-0	16920-0 & 16930-0
IP 229	Copper	16931-0	16930-0
IP 306	Copper		16790-0
IP 307	Copper		16790-0
IP 331	Iron/Steel		16780-0 & 16790-0
IP 335	Copper		16790-0
BS 148	Copper		16790-0
ISO 4263	Copper/Steel	16921-0	16920-0 & 16930-0
DIN 51 587	Copper/Steel	16921-0	16920-0 & 16930-0
NF T60-150	Copper/Steel	16921-0	16920-0 & 16930-0
IEC 1125 A & B	Copper		16790-0

COPPER & SILVER CORROSION BATHS

ASTM D130; D4048; D4814 Annex; IP 112; IP 154; IP 227 (obs); IP PM DJ 2005; BS 2000 Parts 112 & 154; DIN 51 811; EN 2160; FTM 791 5325; NF M07-015; JIS K2513

A range of stirred water or oil filled baths featuring digital temperature control to an accuracy ±0.1°C. All baths are manufactured from stainless steel and have a stainless steel top plate with multiple positions for test stations. Each position is equipped with a lid with an integral hook for suspending either a copper corrosion test vessel (Seta 11500-0) or a test tube support (Seta 11420-0).

A test tube support can hold up to three test tubes (Seta 11590-0). Any combination of copper corrosion vessels and test tube supports may be used. The Oxi-Cor can also accept up to three oxidation test vessels.

15550-2 SETA OXI-COR BATH

Also suitable for OXIDATION TESTS to: ASTM D525; D873; D5304; IP 40; IP 138; BS 2000 Parts 40 and 138; ISO 2160; FTM 791 3352; FTM 791 3354; NF M07-012; NF M07-013; JIS K2276 and for Accelerated Shelf Life Test for Dried Pet Food (Provisional)

- Ambient +5°C to 150°C temperature range
- 4 test stations (3 when used for Oxidation Tests)
- Copper/Silver Corrosion and Oxidation tests
- Optional automatic pressure monitoring

The Oxi-Cor Bath, when used with the relevant accessories, is an economic and versatile bath capable of carrying out copper/silver corrosion tests (including ASTM D4814) and oxidation tests (including IP 40).

Oxi-Cor is a four station bath with a maximum temperature of 150°C, and is temperature controlled to ±0.1°C by a top mounted thermostir circulator with integral over-temperature and low fluid level protection devices.

A Silver Corrosion Conversion Kit (Seta 11510-0) is available to convert test stations to hold Seta 11430-0 glassware, and a Silver Corrosion Test Kit - Gasoline (Seta 11515-0) allows silver corrosion tests to ASTM D4814 to be carried out at two test positions.

For oxidation tests, one or more of the lids may be replaced by up to a maximum of three Seta 15802-0 Oxidation Vessels and pressure measuring/monitoring devices. Further details of using the Oxi-Cor as an Oxidation Bath are shown in the Oxidation Section on page 68.

SUPPLIED WITH: 4 lids, mains lead and instruction manual.

BIO-FUEL TESTING

15550-2 (Corrosion/Oxidation glassware and vessels supplied separately)

11400-6 SETA COPPER/SILVER CORROSION BATH

- Ambient +5° to 150°C temperature range
- Copper and silver corrosion tests
- 9 test stations

The 11400-6 is an oil filled bath with a maximum temperature of 150°C and nine test stations. The bath is protected against over-temperature and low fluid level.

A Silver Corrosion Conversion Kit (11510-0) is available to provide coolant flow to six sets of silver corrosion glassware (11430-0).

SUPPLIED WITH: 9 lids, mains lead and instruction manual.

BIO-FUEL TESTING

11400-6 with Accessories (supplied separately)

COPPER & SILVER CORROSION BATHS

11300-0 SETA COPPER CORROSION BATH

- Ambient +5° to 100°C temperature range
- Copper and Silver corrosion tests
- 2 test stations
- Small footprint

The 11300-0 is an ultra compact water filled bath with a maximum temperature of 100°C and two test stations. The bath is protected against low water level.

SUPPLIED WITH: 2 lids, mains lead and instruction manual.

BIO-FUEL TESTING

11305-0 SETA HIGH TEMP COPPER CORROSION BATH

- Ambient +5° to 150°C temperature range
- 2 test stations

The 11305-0 is a high temperature version of the 11300-0 Seta Copper Corrosion Bath. The oil filled bath has a maximum temperature of 150°C and is protected against over-temperature and low fluid level.

SUPPLIED WITH: 2 lids, mains lead and instruction manual.

BIO-FUEL TESTING

11300-0 with Accessories (Supplied separately)

11308-0 SETA COPPER CORROSION SOLID BLOCK BATH

- Dry heating for up to 4 test samples
- Accommodates 4 x 25mm OD test tubes
- Rapid heat up time
- Ambient to 150°C
- ±0.1°C accuracy at 150°C
- Over temperature cut-off
- External temperature probe for in-block or in-sample measurement
- Function timer for delayed start/stop (1 min - 72 hours)
- Audible end of test buzzer

A precision processor controlled block heater bath with 4 test wells designed to take Copper Corrosion test tubes as specified in ASTM D130; IP 154. The external temperature probe allows control of either the sample or the bath block and a separate test well is provided for calibration checks. The bath has an integral timer and audible alarm.

SUPPLIED WITH: block extractor tool, mains lead and instruction manual.

BIO-FUEL TESTING

SPECIFICATIONS

Seta Part No:	15550-2	11400-6	11300-0	11305-0	11308-0
Temperature Range:	Ambient +5 to 150°C	Ambient +5 to 150°C	Ambient +5 to 100°C	Ambient +5 to 150°C	Ambient to 150°C
Temperature Stability:	±0.1°C	±0.1°C	±0.1°C	±0.1°C	±0.1°C
No of Test Stations	4	9	2	2	4
Bath Fluid	Water or Oil	Water or Oil	Water	Water or Oil	N/A
Bath Capacity:	35 Litres	35 Litres	18 Litres	18 Litres	N/A
Heater Power:	1500W	1500W	1200W	1500W	300W
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz	110/120V, 50/60Hz 220/240V, 50/60Hz	110/120V, 50/60Hz 220/240V, 50/60Hz	110/120V, 50/60Hz 220/240V, 50/60Hz	110/120V, 50/60Hz 220/240V, 50/60Hz
Size (HxWxD):	41 x 45 x 33cm	52 x 45 x 33cm	52 x 34 x 23cm	52 x 34 x 23cm	10 x 20 x 28cm
Weight:	10kg	10kg	9kg	9.5kg	3kg

COPPER & SILVER CORROSION BATHS

ACCESSORIES – Copper & Silver Corrosion Baths

REQUIRED

Select from the table "ITEMS REQUIRED FOR EACH TEST".

11241-0 SILICONE CARBIDE PAPER, 105µm (150 grit FEPA), 28 x 23cm, pack of 50.

11420-0 SUPPORT, for copper tests except natural gasoline and aviation fuels. Holds three test tubes in bath, pack of 2.

11430-0 SILVER CORROSION GLASSWARE, comprises amber glass oil test tube, cold finger condenser with glass hook for test strip and glass cradle.

11440-0 SILVER TEST STRIPS, 99.9% Ag, pack of 5, (*for details see below*).

11450-0 ASTM COLOUR STANDARD, ASTM D1660; D3241/IP323.

11460-0 SILICONE CARBIDE PAPER, 65µm (240 grit FEPA), 28 x 23cm, pack of 50.

11470-0 SILICONE CARBIDE PAPER, 100 grit FEPA, 28 x 23cm, pack of 50.

11480-0 SILICONE CARBIDE GRAINS, 105µm (150 mesh), 5 packs of 500g.

11490-0 GLASS SUPPORT CRADLE, to hold silver token for D4814, pack of 3.

11500-0 COPPER CORROSION TEST VESSEL, for copper tests on natural gasoline and aviation fuels. Stainless steel with 'O' ring sealed screw-top closure. Max working pressure 690kPa (100psi).

PRESSURE CERTIFICATE (WORKS)

11510-0 SILVER CORROSION CONVERSION KIT, adapts 15550-0 for silver corrosion test. Comprises six support rings, water manifold, clips and tubing.

11514-0 TONGS, 150mm long, stainless steel, for sample handling.

11515-0 SILVER CORROSION TEST KIT - GASOLINE, (*for details see page 77*).

11520-0 TEST TUBE EJECTOR SPRING, to aid removal of test tube from corrosion vessel. *Required for D4814 only.*

11530-0 SETA MULTI-STRIP VICE, holds up to five strips while polishing.

11550-0 COPPER TEST STRIP, 99.9% Cu, pack of 30, (*for details see below*).

11570-0 FLAT GLASS TEST TUBE, to protect strip during inspection, pack of 10.

11580-0 ASTM-IP COPPER STRIP CORROSION STANDARD, a set of 13 plaques, printed on aluminium and encapsulated in plastic for protection.

11590-0 TEST TUBE, 25 x 150mm, pack of 10.

22750-2 DIGITAL STOPWATCH, 0.1s resolution, (*for details see page 141*).

94632-0 SILICONE BATH OIL, 20 litres, for filling bath, for temperatures between 100 and 150°C. *Note: 1 required for 11305-0, 2 required for 15550-0 or 11400-6.*

94633-0 BATH OIL, 20 litres, for filling bath, for temperatures up to 80°C. *Note: 1 required for 11300-0 or 11305-0, 2 required for 15550-0 or 11400-6.*

ACCESSORIES – Cont'd

REQUIRED

94635-0 BATH OIL, 20 litres, for filling bath, for temperatures between 80 and 120°C. *Note: 1 required for 11300-0 or 11305-0, 2 required for 15550-0 or 11400-6.*

THERMOMETERS:

ASTM12C/IP64C or ASTM12F/IP64F

OPTIONAL

15650-0 WATER PURIFIER, to minimise scale production.

Note: Other items which may be required include Solvents, Stainless steel forceps.

ITEMS REQUIRED FOR EACH TEST

Seat Part No.	Copper Corrosion		Silver Corrosion	
	D130	D4048	D4814	
	IP 154	IP 112	IP PM DJ 2005	IP 227
11241-0	●	●		●
11420-0		●		
11430-0				●
11440-0			■	●
11450-0				●
11460-0	●	●	■	●
11470-0	●	●		
11480-0	●	●	■	●
11490-0			■	
11500-0	●		■	
11510-0				▲
11514-0	●	●	■	●
11520-0			■	
11530-0	●	●	■	●
11550-0	●	●		
11570-0	●	●	■	
11580-0	●	●	●	
11590-0		●	■	
22750-2			●	
ASTM12C	●	●	●	●

Items marked ■ are available as a kit (Seta Part No. 11515-0) for tests to ASTM D4814.

Item marked ▲ is only suitable for use with 15550-2 and 11400-6.

COPPER & SILVER TEST STRIPS

22190-0 COPPER TEST STRIP

ASTM D1838; IP 411; BS 2000 Part 411; BS 6924; EN 6251; ISO 6251; NF M41-007

- 99.9% purity

Finished to 75 x 12.5 x 2.4mm with 3.0mm hole for suspension. Ready for final polish according to the test method. Supplied in pack of 30 strips.

22190-0

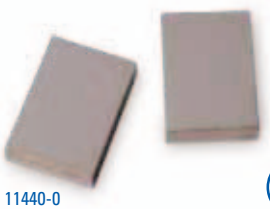
CONFORMANCE CERTIFICATE (WORKS)

11440-0 SILVER TEST STRIP

ASTM D4814; IP 227 (obs); IP PM DJ 2005

- 99.9% purity

Finished to 19 x 12.7 x 3mm. Ready for final polish according to the test method. Supplied in pack of 5 strips.



11440-0

CONFORMANCE CERTIFICATE (WORKS)

11550-0 COPPER TEST STRIP

ASTM D4048; IP 112; BS 2000 Part 112

- 99.9% purity

Finished to 75 x 12.5 x 2.4mm. Ready for final polish according to the test method. Supplied in pack of 30 strips.

CONFORMANCE CERTIFICATE (WORKS)

ACCESSORIES – Copper & Silver Test Strips

OPTIONAL

11241-0 SILICONE CARBIDE PAPER, 105µm (150 grit FEPA), 28 x 23cm, pack of 50.

11460-0 SILICONE CARBIDE PAPER, 65µm (240 grit FEPA), 28 x 23cm, pack of 50.

11470-0 SILICONE CARBIDE PAPER, 100 grit FEPA, 28 x 23cm, pack of 50.

11480-0 SILICONE CARBIDE GRAINS, 105µm (150 mesh), 500g/pack, 5 packs.

11530-0 SETA MULTI-STRIP VICE, holds up to five strips while polishing.

Note: Other items which may be required include: Petroleum Spirit 40/60, Diethyl Ether.

SILVER CORROSION IN GASOLINE

11515-0 SILVER CORROSION TEST KIT – GASOLINE

ASTM D4814 Annex; IP PM DJ 2005

- Complete kit for two test stations
- Silver test tokens included
- Test token preparation materials included

Note: An ASTM12C thermometer and a corrosion bath, are required.

CONFORMANCE CERTIFICATE (WORKS)

11515-0 (components for 1 test position only)

CORROSION IN LPG

22220-4 SETA CORROSION TEST BATH

Stainless steel water bath which accommodates up to 3 pressure vessels. Fitted with heater and thermostatic temperature controller with integral circulator and LED display.

SUPPLIED WITH: mains lead, instruction manual and gabled stainless steel lid.

SPECIFICATIONS	
Temperature range:	Ambient +5°C to 100°C
Stability:	± 0.2°C
Capacity:	38 litres
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Power:	1.4kW
Size (HxWxD):	60 x 35 x 33cm
Weight:	9kg

ACCESSORIES

REQUIRED

11241-0	SILICONE CARBIDE PAPER, 105µm (150 grit FEPA), 28 x 23cm, pack of 50.
11460-0	SILICONE CARBIDE PAPER, 65µm (240 grit FEPA), 28 x 23cm, pack of 50.
11470-0	SILICONE CARBIDE PAPER, 100 grit FEPA, 28 x 23cm, pack of 50.
11480-0	SILICONE CARBIDE GRAINS, 105µm (150 mesh), 5 packs of 500g.
11530-0	SETA MULTI-STRIP VICE, to hold copper strips while being polished.
11570-0	FLAT GLASS TEST TUBE, to protect strip during inspection, pack of 10.
11580-0	ASTM-IP COPPER STRIP CORROSION STANDARD, a set of thirteen plaques, printed on aluminium and encased in plastic for protection.
22150-5	SETA LPG CORROSION PRESSURE VESSEL (*for details see separate entry*).
22190-0	COPPER TEST STRIP, 75 x 12.5 x 2.4mm with 3.0mm hole, pack of 30.
22230-0	SETA BRACKET, holds Pressure Vessel correctly in bath, pack of 3.

THERMOMETERS:

ASTM12C/IP64C or ASTM12F/IP64F

22220-4 with 22150-4 (supplied separately)

22150-5 SETA LPG CORROSION PRESSURE VESSEL

ASTM D1838; IP 411; ISO 6251; NF M41-007; BS 2000 Part 411; BS 6924; EN 6251

- Pressure tested to 6890kPa (1000psi)

Used to determine the resistance to corrosion of a polished copper strip when immersed in LPG.

Comprises polished stainless steel vessel with two stainless steel needle valves, dip tube and 'O' ring sealed cap. Tested to 6890kPa, (1000psi).

PRESSURE CERTIFICATE (WORKS)

22150-5

RUST PREVENTION TEST

11200-5 SETA RUST PREVENTION TEST BATH

ASTM D665; D3603; D5534; IP 135; BS 2000 Part 135; FTM 791 4011; ISO 7120; NF T60-151; JIS K2510; NACE TM0172-2001

- Ambient +5°C to 120°C temperature range
- 7 test stations
- Constant speed sample stirrers
- Quick release stirrers
- Digital temperature controller
- Bath viewing window and door

Indicates the ability of steam turbine oils to prevent rusting of ferrous components, should water become mixed with the oil. Also used to test the corrosive properties of cargoes in petroleum product pipelines.

The 31 litre capacity oil bath has a temperature range of ambient +5°C to 120°C, and is controlled by a digital thermostir unit to within ±0.1° @65°C. The top panel of the bath accepts up to seven test beakers. Each beaker is stirred at 1000 ±50 rev/min by a quick release paddle stirrer.

The test specimen, mounted in a holder (acrylic for normal oils, PTFE for synthetic fluids) is immersed in the test fluid in the beaker and supported by the beaker cover. A hinged front panel allows visual check to be made of sample mixing while the beakers are immersed in the bath.

SUPPLIED WITH: seven standard stirrers and beakers, mains lead and instruction manual.

SETAPLUS EXTENDED WARRANTY AVAILABLE

TECHNICAL DATASHEETS AVAILABLE

11200-5

SPECIFICATIONS

Bath capacity:	31 litres
Temperature range:	Ambient +5°C to 120°C
Temperature Stability:	±0.1° @ 65°C
Stirrer speed:	1000 ±50 rev/min
Test positions:	7
Voltage:	110/120V, 60Hz 220/240V, 50/60Hz
Power:	1.5kW maximum
Size (HxWxD):	63 x 85 x 38cm
Weight:	52kg

ACCESSORIES – Rust Prevention Test Bath

REQUIRED

Select from the table "ITEMS REQUIRED FOR EACH TEST".

TEST SPECIMENS & HOLDERS:

Select from the table "ITEMS REQUIRED FOR EACH TEST" and refer to page 79.

11210-2	SETA STIRRER WITH AUXILIARY BLADE, used for heavier than water fluids, pack of 2.
11240-0	ALUMINIUM OXIDE CLOTH, 150 grit (FEPA), 28 x 23cm, pack of 50.
11250-0	ALUMINIUM OXIDE CLOTH, 240 grit (FEPA), 28 x 23cm, pack of 50.
11260-0	BAFFLED BEAKER, with 2 baffles, for NACE TM0172-2001 tests, pack of 4.
11275-0	GRINDING AND POLISHING RIG, polishes the specimen at the speed specified in the method.
11280-0	SETA CHUCK BODY AND LOCK NUT, grips test specimen during polishing.
11325-0	BEAKER, 25ml, 30mm dia., 50mm high, flat bottom.
11225-0	SYNTHETIC SEA WATER SOLUTION, ASTM D665 procedure B, 30ml, pack of 10, (*for details see page 79*).
11227-0	SYNTHETIC SEA WATER SOLUTION, ASTM D665 procedure B, 300ml, (*for details see page 79*).
99100-2	ANALYTICAL BALANCE, (*for details see page 141*).
99200-2	LABORATORY OVEN, (*for details see page 137*).
94633-0	BATH OIL, technical white oil, 20 litres, for temperatures up to 80°C. *Note: 2 required.*
94635-0	BATH OIL, technical white oil, 20 litres, for temperatures between 80 and 120°C. *Note: 2 required.*
45001-0	SETAPLUS EXTENDED 12 MONTH WARRANTY

THERMOMETERS:

ASTM9C/IP15C or ASTM9F/IP15F or ASTM34C/IP21C

ITEMS REQUIRED FOR EACH TEST

Seta Part No.	D3603	D5534		D665			NACE
		Part A	Part B	Procedure A Distilled Water	Procedure B Synthetic Sea Water	Procedure C Heavier than Water Fluids	TM0172-2001
11210-2						●	
11220-0			●	●	●	●	●
11240-0	●	●	●	●	●	●	●
11250-0	●	●	●	●	●	●	●
11260-0							●
11275-0	●	●	●	●	●	●	●
11280-0	●	●	●	●	●	●	●
11290-0				■	■	■	
11325-0			●				
11330-0	●	●	●				
11335-0	●	●	●				

Items marked ■ are used when testing synthetic oils.

CONSUMABLES Rust Prevention Test Bath

2 Years/2000 Tests — Qty

11200-005	BEAKER, 400ml, pack of 10	1
11200-503	STIRRER, pack of 2.	1
11225-0	SYNTHETIC SEA WATER SOLUTION, ASTM D665 procedure B, 30ml, pack of 10	1
11227-0	SYNTHETIC SEA WATER SOLUTION, ASTM D665 procedure B, 300ml.	1

Note: Other items which may be required include: Naptha, Distilled Water.

RUST PREVENTION TEST SPECIMENS & HOLDERS

11220-0 VERTICAL TEST SPECIMEN & ACRYLIC HOLDER

11220-0

ASTM D665 Procedures A, B & C

Comprises a vertical test specimen (11220-001) with an acrylic holder and beaker cover for testing non synthetic oil samples. Pack of 5.

CONFORMANCE CERTIFICATE (WORKS)

11290-2 VERTICAL TEST SPECIMEN & PTFE HOLDER

ASTM D665 Procedures A, B & C; NACE TM0172-2001

A PTFE version of the 11220-0 for testing synthetic oil samples and gasoline tests to NACE TM0172-2001. Pack of 5.

CONFORMANCE CERTIFICATE (WORKS)

11220-001 TEST SPECIMEN

11220-001

ASTM D665 Procedures A, B & C, NACE TM0172-2001

A vertical test specimen with a ground finish. Suitable for use with 11220-0 and 11290-0. Pack of 5.

CONFORMANCE CERTIFICATE (WORKS)

11335-0 BEAKER COVER AND TEST SPECIMEN HOLDER

11335-0

ASTM D3603; D5534

Comprises an acrylic beaker cover and holder suitable for use with 11330-0 test specimens.

CONFORMANCE CERTIFICATE (WORKS)

11330-0 PAIR OF TEST SPECIMENS

11330-0

ASTM D3603; D5534

Comprises one each vertical and horizontal test specimens with a ground finish, an acrylic holder, and a PTFE washer.

CONFORMANCE CERTIFICATE (WORKS)

11225-0 SYNTHETIC SEA WATER SOLUTION (10 x 30ML)

11227-0 SYNTHETIC SEA WATER SOLUTION (300ML)

11227-0

ASTM D665 Procedure B

CONFORMANCE CERTIFICATE (WORKS)

9

FUEL PARTICULATES

SA1000-0 avcount PARTICLE COUNTER

SA1200-0 avcount PARTICLE COUNTER (BATTERY POWERED)

ASTM D7619 Standard Test Method for Counting and Sizing Particles in Light and Middle Distillate Fuels, and Liquid Bio Fuels, by Automatic Particle Counter; IP 565; DEF STAN 91-91; ISO 4406 (1999); prEN 60970:2006

- Fully automatic operation
- Particle size 4µm to >70µm (ISO 11171)
- Cumulative & distributive particle numbers
- ISO 4406: 1999 codes
- Uses "Straight from the Bottle" samples
- Internal Double Pump System
- Built-in printer
- Precise and reliable results
- In-line side-stream tests up to 10bar (310 bar option)
- Rugged case for laboratory or portable field use
- On-Site calibration

BIO-FUEL TESTING

OPTIONAL SOFTWARE AVAILABLE

TECHNICAL DATASHEETS AVAILABLE

SA1000-0

The potential for particulate (dirt) contamination in the fuel supply and distribution systems is a major concern, particularly from:

- Refinery Processing Materials
- Corrosion & Rust in Pipes and Tanks
- Airborne Solids
- Degraded & Damaged Hoses and Filters
- Microbiological Growth

A rugged and portable laser based particle counter for checking and maintaining the quality of fuel throughout the distribution network. Optimised for measuring particulate content in the range of $4\mu m_{(c)}$ to $>70\mu m_{(c)}$ diameter in Aviation Jet Turbine Fuels (AvTur), avcount is also suitable for testing biofuels and biofuel blends, heating oil, gas oil, diesel - automotive and marine, gasoline and kerosines.

The avcount uses the light obscuration principle, where the fluid under test is passed through a cell comprising a laser and a calibrated sensor. Particles in the fluid cast a shadow onto the sensor, which determines the area/diameter and number of particles in the sample.

Sampling and measurement is simple; fuel is drawn from a sample container or directly from the supply line. avcount has a 10 bar standard pressure rating or can sample up to 315 bar line pressure using the optional pressure reducing system. An integral pump automatically draws the sample through an internal measuring chamber, removing the need for an external sampling pump.

avcount is fully automatic once the test sequence is started. The instrument flushes the cell with sample prior to commencing the measurements. A precise volume of sample is then analysed. The flushing/sample analysing sequences are automatically repeated in accordance with the selected test method.

Results are displayed on the LCD screen in real time and printed out on the integral printer as the test progresses. The results are shown for 6 particle size bands in Particles/ml and ISO Code. Results can be saved to memory for trend analysis of samples, printed out on the integral printer or downloaded to a PC or external printer.

The "Log and Show" software option allows data to be downloaded from the instrument to a PC in different formats and allows the instrument to be fuly controlled and configured from any Windows interface.

ACCESSORIES - AvCOUNT PARTICLE COUNTERS

OPTIONAL

SA1002-0	FLIGHT CASE (SA1000-0 & SA12000-0)
SA1003-0	PC SOFTWARE (SA1000-0 & SA12000-0)
SA1024-0	FLIGHT CASE (SA1000-2)
SA1026-0	PC SOFTWARE (SA1000-2)

SAMPLE HANDLING

SA1004-0	250ml BOTTLES AND CAPS (pack of 30).
SA1005-0	CONTAINER SAMPLING KIT, 51mm bung.
SA1008-0	HIGH PRESSURE ADAPTOR, for sampling at up to 315 bar (Factory option).
SA1010-0	BOTTLE TUMBLER, fitted with holder for 250ml 'syrup' bottle.
SA1014-0	500ml BOTTLE CARRIER, for SA1010-0.
SA1016-0	ADJUSTABLE BOTTLE CARRIER, up to 1000ml 'syrup' bottle, fits SA1010-0.
SA1020-0	IATA 5 litre TUMBLER
SA1022-0	SAMPLING KIT, 32.5mm bung, 300mm tube length.

CALIBRATION, VERIFICATION & SERVICING

SA1001-0	CALIBRATION FLUID, 250ml bottle, with certificate.
SA1006-0	VERIFICATION FLUID, 250ml bottle, with certificate.
99320-2	SETA ULTRASONIC CLEANING BATH (*for details see page 142*).
SA1030-0	AvCOUNT SERVICE KIT
SA1035-0	AvCOUNT TOOL KIT
SA1100-0	SERVICE AND CALIBRATION

CONSUMABLES - AvCOUNT PARTICLE COUNTERS

100 Tests		Qty
SA1000-003	PRINTER PAPER (SA1000-0 & SA1200-0), pack of 10 rolls	2
SA1030-0	AvCOUNT SERVICE KIT	2

FUEL PARTICULATES

Seta Analytics

SA1000-2 avcount2 PARTICLE COUNTER

ASTM D7619 Standard Test Method for Counting and Sizing Particles in Light and Middle Distillate Fuels, and Liquid Bio Fuels, by Automatic Particle Counter; IP 565; DEF STAN 91-91: ISO 4406 (1999); ISO 4406 (1991), GOST 17216, NAS 1638, SAE AS4059E, SAE A6D, SAE 749D, GB 5930, GJB 420-1987, GJB 420-A-1996, GJB 420B-2006

- All the features of the original AvCount plus;
- Easy to use large colour touch screen display
- 15 fixed measuring channels
- Additional particle counting methods
- Save up to 2000 measurements across 60 memories
- Download to a USB memory stick
- 16 Point calibration
- Smaller case size
- English, Chinese or German language selection

BIO-FUEL TESTING

OPTIONAL SOFTWARE AVAILABLE

TECHNICAL DATASHEETS AVAILABLE

SA1000-2

avcount2 combines an improved user interface and re-packaged electronics with the accuracy and reliability of the pump and sensor from the original avcount in a more compact case.

The avcount2 is controlled via icons or a virtual keyboard using the colour touch sensitive screen. Results are displayed in real time and are simultaneously printed out on the compact integral printer.

The test methods embedded in avcount2 cover a range of fuels, lubricating oils and hydraulic fluids. Test methods can be edited to create custom test profles.

Improved connectivity and better memory management allows results to be accessed, printed out or downloaded to a memory stick via the USB port, or to a personal computer via the RS232 Port. The avcount2 can also be controlled via the RS232 port.

avcount2 utilises 16 point calibration and can be re-calibrated on-site by a Seta trained engineer.

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SPECIFICATIONS

Seta Analytics part no:	SA1000-0 & SA1200-0	SA1000-2
Particle Size Range:	ISO 11171: 4µm to >70µm	ISO 11171: 4µm to >70µm ISO 4402: 2µm to >100µm GOST17216-71: 2µm to >200µm
Measuring Channels:	8	15
Counts per Measurement (max):	16.000.000	16.000.000
Sample Viscosity (max):	68mm²/s (from sample bottle) 500mm²/s (@10bar)	68mm²/s (from sample bottle) 500mm²/s (@10bar)
Sample Temperature Range:	0 to 80°C	0 to 80°C
Size Bands Reported During Test:	As specified in Test Method	As specified in Test Method
Size Bands Reported on Recall	As specified in Test Method	All channels
Results:	Particles/ml (cumulative and distributive) ISO Codes to ISO 4406: 1999 (cumulative)	Particles/ml or Particles/10ml (Test Method dependant) Cumulative and Distributive Cleanliness Codes, Cumulative or Distributive (Test Method dependant)
Cell Volume @ Flow Rate:	10ml @ 30ml/min	10ml @ 30ml/min
Total Sample Volume used (typ):	80ml (includes rinse cycles) for IP 565	80ml (includes rinse cycles) for IP 565 & ASTM Multifuel 20ml other methods
Sample Pressure (max):	10 bar (310 bar with SA1008-0 option)	10 bar (310 bar with SA1008-0 option)
Display and Control:	LCD display, 4-key-operation	Touch sensitive screen
Measuring Mode:	Single or cyclic measurement (cycle period 1 - 99 min)	Single or cyclic measurement (cycle period 1 - 99 min)
Particle Count Alarm:	Low Limit/High Limit, User defined	Low Limit/High Limit, User defined
Printer:	Lid mounted integral thermal printer	Integral compact thermal printer
Computer interface:	RS232C (control and data download)	RS232C (control and data download) USB (data download) USB Memory Stick (data download)
Voltage;	100/230VAC, 50/60Hz, max 30W (12VDC for SA1200-0)	100/230VAC, 50/60Hz, max 30W or 24VDC
Size (HxWxD):	37 x 33 x 21cm	24 x 33 x 24cm
Weight:	11kg	12kg

FILTRATION TESTS

16160-2 SSAFCON SAMPLER

ASTM D2276; D3830 (obs); IP 216; FTM 791 3008

- Filter tests for particle contamination and colour rating of Aviation Fuels
- Eliminates the exposure of fuel during testing
- In-line test - no fuel disposal/waste requirement
- Improves operator safety

SSAFCON is a unique monitoring system for portable line sampling of aviation turbine fuel to determine particulate contamination and colour ratings.

SSAFCON assists the routine filtration performance tests such as ASTM D2276-IP 216, which are carried out at fuel terminals and throughout airport distribution systems. The system provides a self contained and safer alternative to traditional hose end sampling, eliminating trailing hoses and exposure to fuel in the airport service area.

SSAFCON mounting trays (16165-2) are permanently installed at the sampling points downstream of the filtration system, typically at a designated static test site, hydrant dispenser or onboard the fuelling vehicle. SSAFCON Sampler (16160-2) connects to the mounting tray by self-sealing quick release couplings and an earthing clip. Docking/undocking of the Sampler is rapid and safe.

An integral volume meter and pressure valve are used to control flow rate and monitor the volume of fuel passed through the filter. After sampling, the Sampler is quickly and safely disconnected from the Tray and the filter removed for gravimetric or colorimetric analysis.

SUPPLIED WITH: fitting kit and full instructions.

SETAPLUS EXTENDED WARRANTY AVAILABLE

TECHNICAL DATASHEETS AVAILABLE

SPECIFICATIONS	
Size (HxWxD):	10 x 20 x 40cm
Weight:	6kg

16160-2 (Mounting Tray and Monitor Cases supplied separately)

ACCESSORIES - SSAFCON Sampler

REQUIRED

16165-2	MOUNTING TRAY, supplied with compression fittings suitable for connection to 1/4 inch o/d fuel line.
16170-0	MONITOR CASE (reuseable), pack of 48.
16180-0	FILTER (37mm dia., 0.8µm) AND SUPPORT PAD (disposable), pack of 100.
	OR
16190-0	MONITOR REFILL, matched weight, with thick absorbent pads. Alternative to 16180-0, avoids need to initially weigh the filter, pack of 50.

OPTIONAL

16200-0	COLOUR RATING BOOKLET, ASTM, each colour reference is certified by Munsell Colour to standards for chroma, value and hue, and laminated for fuel resistance. In accordance with ASTM D2276-IP 216/D3830 (obs).
16210-0	COLOUR AND PARTICLE RATING CHART, 33 colour and 9 particulate photographs on one chart. Colours in accordance with ASTM D2276-IP 216 and particulate references by permission of Shell Oil.
16220-0	TWEEZERS, with blunt points and slip lock to grip filters, pack of 2.
16230-0	FILTER FILE, notebook with 10 filing pages, and 500 mini envelopes to hold filters.
99200-2	LABORATORY OVEN, (*for details see page 137*).
45000-0	SETAPLUS EXTENDED 12 MONTH WARRANTY

Note: Other items which may be required include: Hoses, Solvents, Balance.

19720-0 FILTRATION KIT

IP 440; EN 12662

- Filtration test for Middle Distillates

Comprises 0.8 micron Filter, Filter Membrane, stainless steel Filter Holder with stainless steel screen, Filter Forceps, Vacuum Filtering Flask, 250ml Beaker, 600ml Beaker, 1 litre Beaker, Watch Glass, and Tubing.

19722-0 SSAFLAB FILTRATION KIT

ASTM D5452; IP 423

- Filtration test for Aviation Fuels

Comprises 0.45 micron Filter, matched weight pair of 0.8 micron Filters, stainless steel Filter Holder with stainless steel screen, Filter Forceps, 25mm Solvent Filtering Dispenser, Vacuum Filtering Flask, and Petrislide.

19724-0 FILTRATION KIT

ASTM D6217; IP 415

- Filtration test for Middle Distillates

Comprises 0.8 micron Filter, stainless steel Filter Holder with stainless steel screen, Filter Forceps, 25mm Solvent Filtering Dispenser, 2 x Vacuum Filtering Flasks 1 litre cylinder, Watch Glass and Tubing

ACCESSORIES - Filtration Kits

OPTIONAL

19725-0	VACUUM PUMP & REGULATOR
99100-2	ANALYTICAL BALANCE, (*for details see page 141*).
99200-2	LABORATORY OVEN for sample pre-conditioning, (*for details see page 137*).
99205-0	DESSICATOR, 200ml and disc (19720-0 only).
99206-0	SILICA GEL (19720-0 only).

FILTRATION TESTS

91600-3 SETA MFT MULTI FILTRATION TESTER

ASTM D2068; IP 387 (Procedures A, B & C);
Correlates with ASTM D6426 (COLD SOAK); IP PM EA/08

- Portable test for filterability/blocking tendency of Fuel Oils
- Testing of Bio components including FAME material and cold soak testing
- Easy to use, fully automated operation
- Large LCD display
- Results in less than 15 minutes
- Automatic calculation of FBT and F-QF
- Simple calibration/verification of flow, pressure and temperature
- Interface for PC or Printer
- Downloadable Filterability Graph
- Setalert remote alarm option
- Filter housing and filter packs are available according to test method requirements

91600-3

The Seta Multi Filtration Tester is a unique and flexible instrument designed to test distillate fuels including gas oil, gas turbine fuel, kerosine, diesel, biodiesel and biodiesel blends. It performs both existing IP 387/D2068 and D6426 methods, and offers the possibility of testing other types of fuel and adopting future filtration and filterability test procedures.

MFT is microprocessor controlled and provides a simple user interface using 2 buttons and the Seta Multifunctional And Rotational Test (SMART) control feature in conjunction with a backlit alphanumeric 4 line display. The SMART control is exceptionally easy to use for selecting different tests, setting parameters and for calibration of the temperature and pressure sensors. The display provides the operator with test procedure information as well as indicating the selected test method, sample temperature, pressure, volume and the test result.

A printer can be connected to provide a permanent record of the test parameters, results and a filterability graph.

The software permits the operator to set the test volume of liquid up to 1 litre and a maximum pressure of 200kPa. This allows both specification testing and gravimetric tests to be carried out in conjunction with the appropriate filters and holders.

The fuel sample is drawn from the integral fuel reservoir by the pump, and an efficient pulse damper provides smooth and continuous flow. The pressure and temperature of the fuel are continuously monitored while it is pumped through the specified filter into the waste container. The recorded pressure rise, or the volume of pumped sample that causes a specified pressure to be exceeded, are used by the microprocessor to calculate the test result. Standard tests use 300ml of fuel pumped at 20ml/min. Verification and re-calibration is simple and secure.

SUPPLIED WITH: mains lead and instruction manual.

BIO-FUEL TESTING

SETALERT COMPATIBLE

TECHNICAL DATASHEETS AVAILABLE

SPECIFICATIONS

Filter blocking tendency (FBT) range:	1.0 to 30 (low number is best)
Filterability quality factor (FQF) range:	100 to 1 (high number is best)
Maximum pressure:	200kPa
Power:	500W
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz (switchable)
Size (HxWxD):	27 x 43 x 26cm
Weight:	10kg

ACCESSORIES - Multi Filtration Tester

REQUIRED

91615-0	START-UP KIT, PROCEDURE A, comprises filter holder, tweezers, 100 1.6µm filters & exit tubing.
	OR
91616-0	START-UP KIT, PROCEDURE B, comprises adaptor, 1.6µm encapsulated filters & exit tubing.
	OR
91635-0	START-UP KIT, PROCEDURE C, comprises, 5µm encapsulated filters & exit tubing.

OPTIONAL

00100-0	SETALERT REMOTE PAGING SYSTEM
81002-2	PRINTER
91640-0	HOLDER, for 25mm filters.
91645-0	MAINTENANCE KIT (all necessary O rings and seals, two cleaning wires, a damper key, and replacement fuse).
91650-0	CARRY CASE

CALIBRATION, VERIFICATION & TRAINING

22750-2	DIGITAL STOPWATCH, hand-held, 0.1s resolution (*for details see page 141*).
91660-0	MEASURING CYLINDER
91662-0	PRESSURE CALIBRATOR, 76mm pressure gauge.
	CALIBRATION CERTIFICATE (WORKS)
99922-0	PRECISION DIGITAL THERMOMETER (*for details see page 130*).

CONSUMABLES - Multi Filtration Tester

100 Tests		Qty
81002-201	PRINTER PAPER, pack of 20	1
91615-001	FILTERS (A), 1.6µm, pack of 100	1
91616-001	ENCAPSULATED FILTERS (B), 1.6µm, pack of 100	1
91635-001	ENCAPSULATED FILTERS (C), 5µm, pack of 100	1

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CARBON & ASH RESIDUE

97400-2 MICRO CARBON RESIDUE TESTER

ASTM D4530; IP 398; BS 2000 Part 398; ISO 10370

- Carbon residue range 0.1% to 30.0% (m/m)
- 12 sample capacity
- Automatic temperature ramp and gas control
- Equivalent to ASTM D189; IP 13
- Temperature range ambient to 500°C

An automatic airtight furnace that is pre-programmed to run tests to determine the Micro (Conradson) Carbon residue of petroleum products.

The digitally controlled furnace has a temperature range of ambient to 500°C. Temperature, flow and pressure values are automatically controlled and values are displayed on the control panel. The test cycle includes an audible 'end of test' alarm. A 6 place holder for 16ml sample tubes and a 12 place holder for 2ml or 4ml sample tubes are supplied with the instrument (for sample tubes see the Accessories box).

The instrument has an integral condensate trap and an exhaust outlet connection that allows fumes to be vented remotely if testing is not carried out under a fume hood. Low pressure and dual over-temperature cut-outs ensure safe operation. Fan assisted air cooling minimises time between tests.

SUPPLIED WITH: 12 place holder, 6 place holder, removal tool, condensate trap, oven lid, braided hose for N_2 gas (3m), rubber exhaust hose (5m), mains lead and instruction manual.

97400-2 (Sample Tubes supplied separately)

SPECIFICATIONS	
Temperature range:	Ambient to 500°C ±2°C
Ramp rate:	10 to 15°C/min
Thermocouple:	Iron - constanton
Pressure controller:	20 to 750kPa
Primary pressure:	1400kPa max
Flowmeter:	0.1 to 1l/min
Flow rate:	Automatic, 150ml/min or 600ml/min
Consumption:	Approx. 40/l/N_2 per test
Power:	1.6kW
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Size (HxWxD):	46 x 35 x 39cm
Weight:	21kg

ACCESSORIES - Micro Carbon Residue Tester

REQUIRED

97401-0	GLASS SAMPLE TUBE, 2ml, pack of 100.
97402-0	GLASS SAMPLE TUBE, 16ml, pack of 100.
97403-0	GLASS SAMPLE TUBE, 4ml, pack of 100, for ISO 10370, for use with carbon residues below 0.2%.

Note: Other items which may be required include: Nitrogen.

OPTIONAL

97410-0	HOLDER, for mixed sample tubes (2 or 4ml x 6 and 16ml x 3).
99100-2	ANALYTICAL BALANCE, (*for details see page 141*).

99220-2 SETA ASH FURNACE

ASTM D482; D874; IP 4; IP 163; EN 7; ISO 6245; NF M07-045; NF T60-143

Pre-heated airflow system and extended chimney. Maximum temperature 1100°C with over temperature cut-out and door safety power cut off switch.

SUPPLIED WITH: laboratory tongs, gloves, 5 x 100ml and 5 x 120ml tall form Porcelain Crucibles.

ACCESSORIES -Ash Furnace

OPTIONAL

99100-2	ANALYTICAL BALANCE, (*for details see page 141*).
99200-2	LABORATORY OVEN for sample pre-conditioning, (*for details see page 137*).
99205-0	DESSICATOR, 200ml and disc.
99223-0	PLATINUM DISH, 90ml.
99224-0	ULTRA STIRRER AND STAND with dispersing element for sample pre-conditioning.

BIO-FUEL TESTING

SPECIFICATIONS	
Capacity:	7 litres
Chamber size (HxWxD):	9 x 17 x 46cm
Power:	3.9kW
Voltage;	220/240V, 50/60Hz
Size (HxWxD):	65 x 43 x 74cm
Weight:	63kg

CARBON & ASH RESIDUE

SETA CONRADSON TEST UNITS

ASTM D189-IP 13; D2416; BS 2000 Part 13; DIN 51 551; ISO 6615; FTM 791 5001; NF T60-116; JIS K2270

10600-0 and 10610-0 with Accessories

10610-0 SETA CONRADSON TEST UNIT

Comprises a cast iron tripod stand, Skidmore iron crucible with cover, spun sheet iron crucible with cover, spun steel circular hood with chimney, spun steel circular insulation block, and Nichrome wire support.

SPECIFICATIONS	
Size (HxWxD):	23 x 18 x 18cm
Weight:	2.1kg

10600-0 SETA FOUR WAY CONRADSON TEST UNIT

Comprises a four unit stand and four each of the following: Skidmore iron crucible with cover, spun sheet iron crucible with cover, spun steel circular hood with chimney, spun steel circular insulation block, and Nichrome wire support.

SPECIFICATIONS	
Size (HxWxD):	26 x 79 x 29cm
Weight:	15kg

ACCESSORIES – Conradson Test Units

REQUIRED

10710-0	PORCELAIN CRUCIBLE, pack of 10.
10720-0	SETA BURNER, for Coal Gas.
10730-0	GLASS BEADS, 1kg pack.
10740-0	SETA BURNER, for LP Gas.
10750-0	SETA BURNER, for Natural Gas (Methane).

THERMOMETERS:

ASTM8F/8C

Note: ASTM D2416 requires an electric furnace in place of the burners. Other items which may be required include: Charging syringe, Dessicator, Strainer (100 mesh).

OPTIONAL

99100-2	ANALYTICAL BALANCE, (*for details see page 141*).

10900-3 RAMSBOTTOM CARBON RESIDUE BATH

ASTM D524; IP 14; BS 2000 Part 14; BS 4451 (obs); ISO 4262; FTM 791 5002; NF T60-117

- 5 test wells
- Temperature range ambient to 550°C
- Digital temperature control
- Bath and Control bulb temperature displays

A solid block bath with five test wells, digital temperature control, and an independent digital thermometer.

The cast iron block bath is heated by two independent heaters, a disk heater in the base, and a wrap-around band type heater. The controls and display for the digital temperature controller and the separate digital thermometer and thermocouple port (for measuring control bulb temperature) are mounted on the front.

SUPPLIED WITH: 10ml syringe, stainless steel control bulb, thermocouple assembly, mains lead and instruction manual.

BIO-FUEL TESTING

CALIBRATION CERTIFICATE (WORKS)

ACCESSORIES – Ramsbottom Carbon Residue Bath

REQUIRED

10890-0	COKE BULB, borosilicate glass, pack of 50.
10920-0	TONGS, for removing coke bulb from the block bath.

OPTIONAL

10910-0	COKE BULB FILLING RACK, a five-unit rack, arranged to accommodate syringes of 5 or 10ml type. Facilitates filling of Coke Bulbs.
99100-2	ANALYTICAL BALANCE, (*for details see page 141*).

Note: Other items which may be required include: Dessicator, Strainer (100 mesh).

SPECIFICATIONS	
Block temperature range:	Ambient to 550°C
Power:	1300W
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Size (HxWxD):	40 x 42 x 42cm
Weight:	33kg

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SEDIMENT

16120-2 SETACLEAN TOTAL SEDIMENT TESTER

ASTM D4870; IP 375; IP 390 (Procedure A); ISO 10307; BS 2000 Part 375; NF M07-063

- Measures sediment up to 0.5%m/m
- Sample viscosities up to 130mm²/s
- 10g sample size
- Two test stations

A compact bench-mounted unit for determining the insoluble material content of distillate and residual fuel oils.

Consists of two filtration cells, heating (steam) and cooling (water) circuits, and a vacuum circuit with Buchner flask and gauge. Each filtration cell comprises a steam heated/water cooled brass cup with a sintered brass disc to support the microfibre filters. Temperature test points are fitted into the steam input lines, and a digital indicator and probe are available as an accessory.

SUPPLIED WITH: Buchner flask with safety cover, 2 filtration cells, 100 filters, and instruction manual.

SETAPLUS EXTENDED WARRANTY AVAILABLE

SPECIFICATIONS	
Test samples:	10g
Waste flask capacity:	500ml
Filters:	2 per cell 47mm dia., Whatman type GF/A
Services:	Steam 100°C Vacuum 40kPa absolute pressure Cooling Water - ambient temperature
Connections:	10mm dia. riffled nozzles
Size (HxWxD):	40 x 47 x 18cm
Weight:	8kg

16120-2

ACCESSORIES – Setaclean Total Sediment Tester

REQUIRED

14030-2	AIR PUMP, (*for details see page 136*).
16130-3	SETA STEAM GENERATOR, (*for details see page 137*).
16150-2	THERMOMETER, stirring-type as required by test method, 94 to 106°C.

THERMOMETER:
ASTM22C/IP42C

Note: Other items which may be required include: Dessicator, Beakers, Syringe, Weighing bottles, Forceps, Hotplate, Solvents, Mixer.

OPTIONAL

16125-0	DIGITAL THERMOMETER AND PROBE, to monitor steam input temperature.	
99100-2	ANALYTICAL BALANCE, (*for details see page 141*).	
99200-2	LABORATORY OVEN, (*for details see page 137*).	
99224-0	ULTRA STIRRER & STAND	
	Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
	Power:	500W
	Size (HxWxD):	24 x 65 x 80cm
	Weight:	1.6kg
	Speed:	3,400 - 24,000 rpm
45000-0	SETAPLUS EXTENDED 12 MONTH WARRANTY	

OPTIONAL - IP 390 (Procedure A); ISO 10307-2 only

16155-4	SETA FUEL OIL AGEING BATH, with 6 air wells for 3 duplicate tests. microprocessor controlled heater/stirrer is at 120°C ±0.5°C. Features low liquid and over temperature protection.	
	Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
	Power:	1500W
	Size (HxWxD):	27 x 35 x 35cm
	Weight:	10.5kg
16156-0	CONICAL FLASK, pack of 10.	
16157-0	AIR CONDENSER, glass, pack of 10.	

21300-0 SETA EXTRACTION APPARATUS

ASTM D473; IP 53; API 2561; ISO 3735; BS 4382 (obs); FTM 791 3002; NF M07-010

- Sediment content of crude and fuel oils

Determines sediment content of crude oil and fuel oils by extraction with toluene. The sample is placed in a refractory thimble and washed with condensed toluene vapours leaving only insoluble matter, the residue is calculated as a percentage of the total mass. Comprises a tinned copper condenser coil, alumina refractory thimble of porous grade and an Erlenmeyer flask of one litre capacity.

ACCESSORIES – Extraction Apparatus

REQUIRED

21310-0	BASKET THIMBLE SUPPORT, ribbon type.
21320-0	WATER CUP, glass, pack of 5.

OPTIONAL

25000-3	SETA-HOT, 1000W, variable heat control, (*for details see page 137*).
21300-001	THIMBLE, with certificate of conformity.
99100-2	ANALYTICAL BALANCE, (*for details see page 141*).

21300-0, 21310-0 and 21320-0

SPECIFICATIONS	
Size (HxWxD):	20 x 13 x 13cm
Weight:	1.5kg

GUM

12200-3 SETA EXISTENT GUM SOLID BATH

ASTM D381-IP 131; IP 540; BS 2000 Part 131; BS 4348 (obs); ISO 6246; DIN 51 784; NF M07-004; FTM 791 3302; JIS K2261

- 5 Test stations
- Integral steam superheater
- Digital temperature control
- 140 to 260°C temperature range
- Flow gauge calibrated for air and steam

A Solid Block Bath designed to carry out up to five simultaneous tests for determining existent gum content in fuels by the Jet Evaporation method.

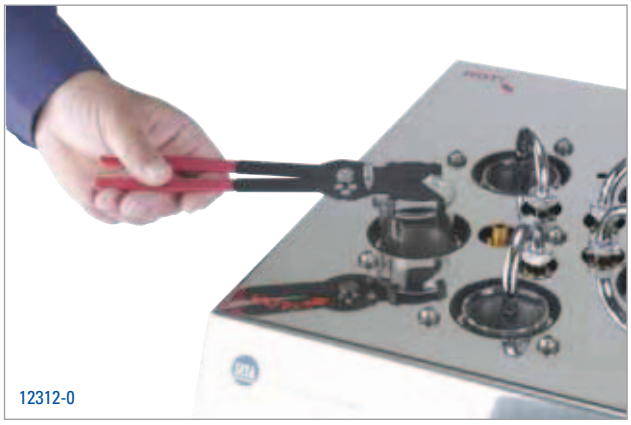
The unit comprises a solid block bath with integral superheater, removable taper-fit conical steam/air jet adaptor with copper screens, and a steam/air flow control valve and gauge. The bath has five test wells, and a thermometer well. Outlets can be individually checked for uniform flow of air or steam. The bath has a temperature range of 140 to 260°C, and is controlled by a digital temperature controller which displays both the set temperature and the actual bath temperature measured by a probe. The flow of steam or air is adjusted by an inlet control valve and monitored on a Bourdon gauge calibrated for both air and steam.

SUPPLIED WITH: a Bourdon gauge type flow indicator, calibrated for both air and steam, five steam/air jet assemblies, five borosilicate glass beakers and an instruction manual.

CALIBRATION & VERIFICATION MATERIALS

SETAPLUS EXTENDED WARRANTY AVAILABLE

SPECIFICATIONS	
Operating temperature range:	140 to 260°C ±5°C
Heaters:	2 x 1kW
Over-temperature cut-out:	280°C (adjustable)
Air/Steam inlet:	15mm o.d pipe
Flow indicator:	Calibrated for min. and max. air and steam flow
Power:	2kW
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Size (HxWxD):	45 x 35 x 50cm
Weight:	45kg



12312-0

12200-3

ACCESSORIES - Existent Gum Solid Block Bath

REQUIRED

12311-2 INSTALLATION KIT, connects bath to steam generator and comprises all tubes, valves, filters and regulators needed for a typical installation.

12312-0 BEAKER EXTRACTION TOOL, for removal of beakers from solid block bath.

THERMOMETERS:

ASTM3C/IP73C or ASTM3F/IP73F

Note: Other items which may be required include: Cooling Vessel, Glass Filtering Funnel, Special detergent or chromic acid, Solvents

OPTIONAL

12310-3 STEAM GENERATOR, electrically heated with water feed pump, safety valve (preset at 1 bar), water level control and cut-out. Produces 18kg/hr (40lb/hr) of steam at 100°C. Maximum working pressure 10 bar (150lbf/in²).

Voltage:	380/415V, 50/60Hz, 3 phase
Power:	12kW
Size (HxWxD):	64 x 61 x 91cm
Weight:	111kg

12314-0 ROTARY COMPRESSOR

Voltage:	240V, 50Hz
Power:	2.2kW
Size (HxWxD):	47 x 27 x 70cm
Weight:	41kg
Output:	0.24 m^3 per min Air
Rated Operating Base:	10 bar

15650-0 WATER PURIFIER, minimises scale formation and connects in-line to water supply. Maximum inlet pressure 5 bar (75psi) and flow 60//hr. Comprises fitting kit and filter cartridge.

99100-2 ANALYTICAL BALANCE, (*for details see page 141*).

99200-2 LABORATORY OVEN, (*for details see page 137*).

45001-0 SETAPLUS EXTENDED 12 MONTH WARRANTY

CALIBRATION, VERIFICATION & TRAINING

12250-0 SETA CALIBRATED AIR FLOWMETER, for calibrating and verifying the flow. Precision flowmeter with negligible back pressure (below 1kPa), graduated at 510, 600 and 690 ml/s.

Size (HxWxD):	57 x 14 x 17cm
Weight:	2.3kg

CALIBRATION CERTIFICATE (WORKS)

12255-0 SETA STEAM CALIBRATION KIT, connects to the bath jet assemblies and is supplied with a 2 litre graduated cylinder for calibrating and verifying the flow/volume of steam.

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H_2S

An Advanced instrument for the rapid measurement of H_2S in liquid petroleum products, including residual marine fuels and refinery feedstock components

SetaAnalytics

SA4000-0 H_2S ANALYSER

ASTM D7621; IP 570 Determination of Hydrogen Sulfide in Fuel Oil - Rapid Liquid Phase Extraction Method

- ISO 8217
- Measurement range from 0-250 mg/kg H_2S (0-250 ppm H_2S) in the liquid phase
- Fast measurement time of 15 minutes
- Non chemical method, no wet chemistry involved
- Small lab bench footprint, fully portable operation
- Ideal for monitoring residual fuel blends, cargoes & products in the distribution system
- Critical Measurement method for Product Safety and Release

The H_2S Analyser was developed with Lloyd's Register's 'Fuel Oil Bunker Analysis and Advisory Service' (FOBAS) along with support of other major international oil companies to provide users with a simple to use instrument (patent applied for). H_2S is efficiently purged from the test sample by a combination of heat and agitation, and is measured by a H_2S specific detector. No costly chemicals are required and eliminates the need for analytical preparation by an expert chemist. The instrument also has the capability (with advice from SetaAnalytics) to measure certain crude oil and other distillate products.

The H2S Analyser provides an industry approved test for supporting quality control and safety, to ensure product is within specification. It is also suitable for remediation treatment, by assisting to quantify scavenger dosing levels for both feedstock components and finished products.

TECHNICAL DATASHEETS AVAILABLE

SPECIFICATIONS	
Measurement range:	0-250 mg/kg H_2S in the liquid phase (0-250 ppm H_2S)
Operating limits:	5 to 40°C maximum (80% RH)
Viscosity range:	Up to 3000 mm²/s at 40°C
Principal of measurement:	Advanced Electrochemical Sensor
Test duration:	15 minutes
Sample size:	1ml, 2ml, 5ml (depending on H_2S concentration)
Diluent volume:	20ml
Computer Interface:	RS232
Power:	60W maximum
Voltage:	12V DC, supplied with universal A/C transformer
Size (HxWxD):	21 x 30 x 41cm
Weight:	8kg

SA4000-0

ACCESSORIES – H_2S Analyser

REQUIRED

SA4001-0	H_2S STATIC CALIBRATION KIT
SA4003-0	START UP KIT, for approximately 20 tests, comprising 5 test vessels, 500ml diluent, 20 disposable syringes, and 2m silicone tubing.

OPTIONAL

81002-2	DATA PRINTER
SA4000-001	CALIBRATED SENSOR
SA4002-0	H_2S PERSONAL PROTECTOR
SA4004-0	PIPETTE, >20ppm samples.
SA4007-0	CARRY CASE
SA4008-0	TEST VESSEL WARMER
SA4010-0	PC CONNECTIVITY KIT

CALIBRATION, VERIFICATION & TRAINING

SA4011-0	AIRFLOW CALIBRATION/VERIFICATION TOOL

CONSUMABLES – H_2S Analyser

SA4005-0	CONSUMABLE KIT, for 180 tests, comprising test vessels, 8 x 500ml diluent, 200 disposable syringes and 2 m silicone tubing.
SA4006-0	ANNUAL SERVICE KIT, comprising carbon filter, particulate filters and tubing kit.

FIJI

An instrument for measuring the presence of all FAME types in AVTUR

Seta Analytics

SA5000-0 FIJI FAME IN JET INSTRUMENT

IP PM-DT "Determination of the fatty acid methyl esters content of aviation turbine fuel with Fourier Transform Infrared spectroscopy - Rapid screening method".

- Measures the presence of all FAME types in AVTUR
- Analysis time 20 minutes
- 50ml sample volume
- Measuring range down to 10 mg/kg
- No hydrocarbon cleaning solvents required
- Laboratory and field instrument
- Suitable for untrained operators
- 110/240V operation & 12V option
- USB connection to PC/Laptop
- Footprint size 36 x 37 x 45 cm
- Windows based, XP/Vista/Windows 7 compliant software

The analyser measures the FAME levels in AVTUR (10 to 400 mg/kg or higher with dilution) to check they are within acceptable industry limits.

Using a unique sample preparation module (patent pending) the sample is pumped at a regulated flow rate through a proprietary disposable cartridge that is interfaced with the instrument. The sample components are spectrally analysed by the FTIR and a result is displayed within typically 20 minutes. The results are displayed as a simple go/no go for field use (user definable limits) and mg/kg volume. The system is self cleaning so no solvents are required. After each test the cartridge is simply and easily replaced and the instrument is immediately ready for the next sample.

TECHNICAL DATASHEETS AVAILABLE

SPECIFICATIONS	
Measurement range:	10-400 mg/kg FAME in Aviation Turbine Fuels
Test duration:	20 minutes
Sample size	50ml
Operating temperature range:	5 to 40°C maximum (80% RH)
Computer interface:	2 x USB (Computer running FIJI software is required for operation)
Power:	50W maximum
Voltage:	100/250V, 50/60Hz
Size (HxWxD):	36 x 37 x 45cm
Weight:	16kg

SA5000-0

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ACCESSORIES - FIJI Fame in Jet Instrument	
REQUIRED	
SA5001-0	FIJI STARTER KIT, comprising 10 cartridges, 10 nylon filters, 280 low lint wipes, 11 50ml beakers, verification fluid 30 mg/kg and verification fluid 100 mg/kg.
OPTIONAL	
SA5003-0	LOW LINT WIPES, pack of 280.
SA5006-0	FIJI LAPTOP
CALIBRATION, VERIFICATION & TRAINING	
SA5020-0	FIJI VERIFICATION FLUID, 30 mg/kg.
SA5021-0	FIJI VERIFICATION FLUID, 100 mg/kg.
SA5025-0	CALIBRATION MATERIAL SET

CONSUMABLES - FIJI Fame in Jet Instrument	
SA5004-050	BEAKERS, 50ml, pack of 50.
SA5005-010	FIJI CARTRIDGE, pack of 10.
SA5005-050	FIJI CARTRIDGE, pack of 50.
SA5005-100	FIJI CARTRIDGE, pack of 100.

ESTERCHECK

A portable instrument for the measurement of Diesel/Bio Diesel (FAME) mixture

Seta Analytics

SA3000-2 ESTERCHECK

EN 14078 Correlation

- Contamination warning
- Instant measurement
- Accurate to less than 1% Bio Diesel
- Hand held robust enclosure - IP 64 rated
- Rechargeable battery operated
- Simple display
- Stainless steel easy clean sensor
- Automatic calibration
- Patent pending

SA3000-2

With increasing instances of material compatibility problems with FAME products, such as fuel pumps, the measurement of bio ester in diesel is now a key test parameter for many users. Recent advances in RF sensor technology provide a portable and low cost solution for this measurement. The robust sensor design is ideally suited for on site work as an early warning of possible contamination. The test procedure requires no special skills or lab conditions and is therefore suitable for a broad range of applications, from batch checking fuels at terminals, through to monitoring fuel supplies for standby power generation systems. Independent trials show good agreement with laboratory based FTIR methods.

EsterCheck is easy to operate - simply dip the probe into the sample to be measured then press 'measure' and % bio diesel will be displayed (reading is stored with time and date). EsterCheck is housed in a robust case with mini USB port that can download readings to a host computer as well as charge the unit.

An additional advantage of the sensor technology is the capability to provide an indication of contamination by non refined vegetable oil, petrol or water, providing a means to ensure integrity of fuel supplies whilst safeguarding plant and storage systems.

The instrument is supplied in a hard case with charger (with international adaptors), sample pots, software disc and user manual. Other accessories, including sample holder and multiple sample storage unit, are available.

SPECIFICATIONS

Compatible Diesel types:	EN 590, ASTM D975
Detectable Bio Diesel (FAME):	RME, SME, PME and composite FAMES (EN 14214, ASTM D6751)
Detectable vegetable oils:	Sunflower, Rapeseed, Corn Oil, Ground Nut Oil
Measurement range:	1 - 100% Bio Diesel
Device storage temperature:	-40 to +70°C
Working temperature range:	+5 to +40°C
Minimum sample container:	30ml
Enclosure:	IP 64
Size (HxWxD):	17 (25 with probe) x 8.6 x 3.4cm

HPLC

Advanced Chromatogpraphy Package

SetaAnalytics

evochrom HPLC SYSTEMS

- Complete HPLC Pack system allows plug and go for the busy lab
- Precision engineered HPLC hardware with proven technology
- Quality separations provide accurate and precise results every time

Each evochrom Diesel System includes:

- Sample Injector
- HPLC Isocratic Pump
- Optional Solvent Reservoir/Degasser Unit
- Column Oven (with Safety Solvent Alarm System)
- Amino Column as specified in Test Method
- Refractive Index Detector
- ChromGate Integration Software Package

SA2000-0 evochrom SDA SYSTEM

ASTM D7524; IP 568

Measures Static Dissipator Additive (SDA) in Jet and Diesel fuels

- Chromatography assured with optimised column technology meeting the latest IP 568 and ASTM 7524 requirements
- Ideal for QC checking in distribution systems

SA2200-0 evochrom DIESEL SYSTEM

ASTM D6591; IP 391; EN 12916

Measures Aromatics in Diesel and Bio-Diesel

- Chromatography assured with optimised column technology meeting the latest ASTM D6591, IP 391 and EN 12916 Method requirements
- Fully compatible to meet and measure to EN 590 Diesel Fuel Specifications for Aromatics

SA2400-0 evochrom JET FUEL SYSTEM

ASTM D6379; IP 436

Measures Aromatics in Aviation and Jet fuels

- Chromatography assured with optimised column technology meeting the latest ASTM D6379 and IP 436 Method requirements
- Fully compatible to meet and measure Aromatics as referenced in DEF STAN 91-91 Jet Fuel Specifications for Aromatics

BIO-FUEL TESTING

OPTIONAL SOFTWARE AVAILABLE

TECHNICAL DATASHEETS AVAILABLE

10

ADSORPTION

14060-0 SETA TWIN-COLUMN ADSORPTION APPARATUS

ASTM D1319; IP 156; BS 2000 Part 156; ISO 3837; FTM 791 3703; NF M07-024; JIS K2536

- % of saturates, olefins and aromatics in petroleum fractions
- Analyses 2 samples simultaneously
- Accepts standard adsorption or precision (True Bore) columns
- Integral UV illumination

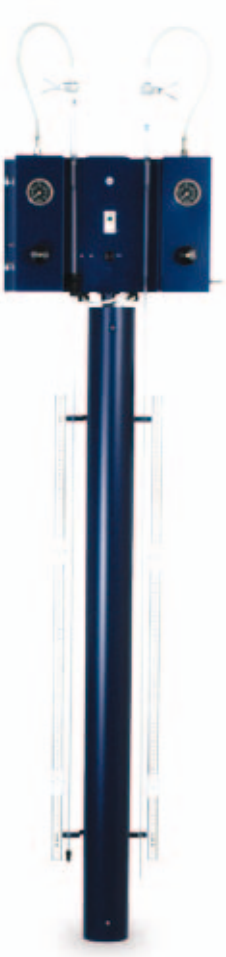
A wall-mounted system that comprises a control box, measuring scales with slide markers, mounting clips for two columns and a 365mm UV light mounted vertically to optimise fluorescence when viewing boundaries and saturates zones. Separate pressure gauges and valves provide individual pressure control to each column.

SUPPLIED WITH: mounting bracket and instruction manual.

Note: Columns (Seta 14080-0 or 14090-0) required.

CALIBRATION & VERIFICATION MATERIALS

SETAPLUS EXTENDED WARRANTY AVAILABLE



14060-0 (Columns supplied separately)

Adsorption Columns and component parts

14070-3

ACCESSORIES - Twin-Column Adsorption Apparatus

REQUIRED

14050-0	CLEANING NEEDLE, stainless steel, 155cm lg, 19 SWG, 45° tip, with connector for 6.5mm (1/4 inch) hose.
14065-0	SILICA GEL, 1kg.
14066-0	FLUORESCENT GEL, 40g.
14070-3	VIBRATOR UNIT - ADSORPTION, for one or two columns to assist packing of silica gel.
14080-0	STANDARD ADSORPTION COLUMNS, set of 2, (*for details see below*).
	OR
14090-0	PRECISION (TRUE BORE) COLUMNS, set of 2, (*for details see below*).
14120-0	HYPODERMIC NEEDLE, 102mm long x 18 gauge. With Luer-lock, pack of 5.
83710-0	HYPODERMIC SYRINGE, 1ml capacity graduated to 0.01ml and fitted with Luer-lock for needle, pack of 10.

Note: Other items which may be required include: Isopropyl alcohol, Nitrogen gas bottle and regulator.

OPTIONAL

45000-0	SETAPLUS EXTENDED 12 MONTH WARRANTY

CALIBRATION, VERIFICATION & TRAINING

99850-0	MULTI-TEST VERIFICATION MATERIAL, ASTM D1319-IP 156 Kerosine (*for details see page 150*).
99854-0	MULTI-TEST VERIFICATION MATERIAL, ASTM D1319-IP 156 Motor Gasoline (*for details see page 151*).

SPECIFICATIONS

Power:	100W
Voltage;	110/120V, 50/60Hz 220/240V, 50/60Hz
Size (HxWxD):	120 x 25 x 15cm
Weight:	20kg

14080-0 STANDARD ADSORPTION COLUMNS

Two standard adsorption columns, each column comprising: 12/2 ball joint, joint clip, charger, capillary with drawn tip, and silicone tubing to join the charger and capillary.

All components available separately, see table.

Seta Part No.	Description	Quantity
13730-005	Silicone Rubber Tubing	2 metres
14080-001	Analyser Section	Pack of 100
14080-002	Charger (Standard)	Pack of 2
14080-003	Ball Joint	Pack of 2
14090-003	Ball Joint Clip	Pack of 5

14090-0 PRECISION (TRUE BORE) ADSORPTION COLUMNS

Two precision (True Bore) adsorption columns, each column comprising: 12/2 ball joint, joint clip, combined charger/separator/analyser section, tip, and tip joint clip.

All components available separately, see table.

CONFORMANCE CERTIFICATE

Seta Part No.	Description	Quantity
14080-003	Ball Joint	Pack of 2
14090-001	Tip	Pack of 2
14090-002	Charger/Separator/Analyser	Pack of 2
14090-003	Ball Joint Clip	Pack of 5
14090-004	Tip Joint Clip	Pack of 5

ASPHALTENES

21200-0 ASPHALTENES APPARATUS

21200-0 with 24410-4 & 24500-0

ASTM D6560; IP 143; BS 2000 Part 143; DIN 51 595; NF T60-115

Determines the amount of wax free material insoluble in n-heptane but soluble in hot toluene. Applicable for gas oil, diesel fuel, fuel oil, lubricating oil, bitumen, and crude petroleum which has been topped to an oil temperature of 260°C. Comprises condenser, extractor, stoppers, stirrer, funnel and evaporation dish.

ACCESSORIES - Asphaltenes Apparatus

REQUIRED

22160-0	RECEIVER, 100ml, pack of 3.
24401-0	GLASS FLASK, 500ml capacity.
24410-4	FLASK HEATER, suitable for one 500ml flask (*for details see page 31*).
	OR
24530-4	FLASK HEATER, suitable for up to three 500ml flasks, requires multiples of 21200-0 and other accessories (*for details see page 31*).
	OR
24540-4	FLASK HEATER, suitable for up to six 500ml flasks, requires multiples of 21200-0 and other accessories (*for details see page 31*)

ACCESSORIES - Continued

REQUIRED

99310-0	EVAPORATION BATH	
	Temp. range:	ambient to 100°C
	Tank capacity:	6 litres
	Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
	Power:	1.5kW
	Size (HxWxD):	28 x 33 x 21cm
	Weight:	10kg
24500-0	SETA STEEL STAND, for use with 24410-4 heater only.	
24520-0	CLAMP	
24650-2	BOSSHEAD, for fitting clamp to stand.	

Note: Other items which may be required include: Filter paper, Forceps, Toluene and Heptane.

OPTIONAL

22750-2	DIGITAL STOPWATCH , 0.1s resolution, (*for details see page 141*).
24403-0	FLASK, 150ml capacity.
24404-0	FLASK, 250ml capacity.
99100-2	ANALYTICAL BALANCE, (*for details see page 141*).
99200-2	LABORATORY OVEN, (*for details see page 137*).

10

ANILINE POINT

10000-0 THIN FILM APPARATUS

10000-0 (25000-3 supplied separately)

ASTM D611 Method B; IP 2 Method B; BS 2000 Part 2; BS 7391 (obs); ISO 2977; FTM 791 3601; NF M07-021; JIS K2256

The Thin Film Apparatus is designed to determine the Aniline Point in samples that are too dark to be determined using ASTM D611 Method A or IP 2 Method A.

SUPPLIED WITH: stand, clamp, mains lead and instruction manual.

CALIBRATION & VERIFICATION MATERIALS

SPECIFICATIONS

Power:	10W
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Size (HxWxD):	78 x 17 x 50cm
Weight:	5.9kg

ACCESSORIES - Thin Film Apparatus

REQUIRED

10120-2	TRANSFORMER UNIT, for 6.5V lamp. Incorporates a brightness control for viewing sample.	
	Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
	Power:	10kW
	Size (HxWxD):	11 x 16 x 23cm
	Weight:	1.7kg
25000-3	SETA-HOT, 1000W electic heater with variable heat control, (*for details see page 147*).	

THERMOMETERS:

ASTM33C/IP20C or ASTM 34C/IP21C or ASTM35C/IP59C.

Note: Two thermometers of the same range are required.

OPTIONAL

99100-2	ANALYTICAL BALANCE, (*for details see page 141*).

CALIBRATION, VERIFICATION & TRAINING

99850-0	MULTI-TEST VERIFICATION MATERIAL, ASTM D611 Kerosine, (*for details see page 150*).

10160-0 GLASSWARE FOR ANILINE POINT METHODS

ASTM D611 Method A; IP 2 Method A; BS 2000 Part 2; BS 7391 (obs); ISO 2977; FTM 791 3601; NF M07-021; DEF STAN 05-50/01 Method 1

Comprises borosilicate glass test tube, jacket, iron wire stirrer and cork.

CALIBRATION & VERIFICATION MATERIALS

ACCESSORIES -Glassware for Aniline Point Methods

REQUIRED

24500-0	STEEL STAND, Base 23 x 14cm, column 76cm x 1.3cm dia, stainless steel.
24250-0	CLAMP, 2 to 90mm capacity.
24650-2	BOSSHEAD, for fitting Seta 24520-0 to steel column.

THERMOMETERS:

ASTM33C/IP20C or ASTM 34C/IP21C or ASTM35C/IP59C.

OPTIONAL

99100-2	ANALYTICAL BALANCE, (*for details see page 141*).

CALIBRATION, VERIFICATION & TRAINING

99850-0	MULTI-TEST VERIFICATION MATERIAL, ASTM D611 Kerosine (*for details see page 150*)

SALT IN CRUDE

99700-4 SALT-IN-CRUDE ANALYSER

ASTM D3230; IP 265

- Switch allowing ASTM or IP mode to be selected
- Automatic salt concentration calculation
- Pre-calibrated for immediate use
- Verification mode
- RS232 interface
- Software supplied
- Battery or mains voltage operation
- Weatherproof

A portable instrument that measures conductivity and temperature of crude oils. The instrument is pre calibrated and automatically calculates the salt concentration in g/m³ or pounds per thousand barrels (ptb) (lb/1000bbl). Measurements can be displayed or downloaded to a PC. Calibration mode allowing 3 point calibration of sensor. In this way the sensor can be replaced and/or recalibrated by the user if it becomes damaged.

SUPPLIED WITH: beaker holder/stand, carry case, mains adaptor, software, RS232 cable and instruction manual.

SOFTWARE SUPPLIED

TECHNICAL DATASHEETS AVAILABLE

SPECIFICATIONS	
Conductivity range:	0 .0 to 151 lb/1000bbl (Res: 0.1lb/1000bbl) 0.0 to 430.0 g/m³ (Res: 0.1 g/m³)
Temperature range:	-20 to 150°C (Res: 0.1°C)
Power supply:	9 volt dc battery or mains adaptor (110/120/220/240, 50/60Hz adaptor supplied
Size (HxWxD):	20 x 7 x 3.5cm
Weight: (including carry case)	1.6kg

CONSUMABLES – Salt-in-Crude Analyser

2 Years/2000 Tests	Qty
99700-301 GLASS BEAKER, pack of 10	1

EXTRACTION APPARATUS

14300-3 SETA DUAL EXTRACTION APPARATUS

ASTM D2547 (obs); IP 77; IP 182; IP 248; BS 2000 Part 182; BS 5290; EN 13 (obs); ISO 2083 (obs); DIN 51 576; NF M07-014; NF M07-023; NF T60-133

- Supports two sets of glassware (Seta 14310-0)
- Two independent heater controllers
- Cooling water control valve

Dual Extraction Apparatus speeds up the determination of lead, acid and salt content and permits parallel analysis.

SUPPLIED WITH: instruction manual and mains lead.

SETAPLUS EXTENDED WARRANTY AVAILABLE

14300-3 and Glassware (supplied separately)

ACCESSORIES – Dual Extraction Apparatus

REQUIRED	
14310-0	GLASSWARE, 2 twin-necked boiling flasks (500ml), each comprising a heating tube and coil, Hopkins reflux condenser, thistle tube, Gooch crucible, a pair of clips, and two 400ml beakers.
OPTIONAL	
99100-2	ANALYTICAL BALANCE, (*for details see page 141*).
45000-0	SETAPLUS EXTENDED 12 MONTH WARRANTY

SPECIFICATIONS	
Power:	500W maximum
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Size (HxWxD):	86 x 38 x 36cm (104 x 38 x 36cm with glassware)
Weight:	15kg

TEST KITS

86500-2 SSAFPAK AVIATION FUEL CONDITION TEST KIT

- Rapid go/no-go testing
- Self contained and fully portable
- Ready to use
- Six simple to use tests
- Laboratory quality flash point tester
- Rugged fitted case

A self contained kit of test equipment for rapid detection of contamination in jet aviation fuel. Designed for use on the apron and at fuel storage facilities, SSAFPAK allows the user to carry out six tests that can quickly provide a go/no-go decision on aviation fuel quality.

Flash Point (ASTM D3828) A Setaflash Series 3 Closed Cup Flash Point Tester provides either go/no-go test, or can determine the actual flash point of the sample. The Setaflash is a laboratory standard instrument featuring an automatic flash detection system that provides a result in two minutes. A power inverter is included to allow operation from a 12V dc supply.

Contamination A Seta Detector Module, designed to fit into the cup of the Setaflash Series 3 Closed Cup Flash Point Tester, provides an indication of contamination of gasoline by kerosine or kerosine by diesel fuel by comparing residues after evaporation.

Density A digital meter is provided to measure the density of the sample.

Conductivity (ASTM D2624) A digital meter measures the conductivity of the sample, verifying that it remains within specification after the addition of static dissipators.

Water Content Shell Water Detection Capsules indicate the presence of finely dispersed undissolved water in aviation fuel by a simple colour change, providing a rapid go/no-go result. A 5ml sample is drawn through the capsule, and the intensity of the colour change gives an indication of the level of contamination, with 30ppm water easily detectable.

Microbial Activity Simple to use test paddles provide a go/no-go test for Hormoconis resinae (HR) in the sample. Each paddle has two test pads, low test has a cut-off at 150µg/l and high test has a cut-off >750µg/l HR in fuel.

SUPPLIED WITH: beakers, wipes, safety glasses, gloves, instruction manuals and carry-case.

86500-2

SPECIFICATIONS	
Size (HxWxD):	35 x 90 x 80cm
Weight:	12kg

86400-2 PORTABLE FUEL INTEGRITY TEST KIT

- Suitable for Jet fuel and other light distillate fuels
- Rapid check for presence of contamination
- Multiple tests in single kit
- Compact, easy to carry rucksack
- Ideal for shipboard use

A self contained kit of test equipment for rapid detection of contamination in fuels. The kit has been designed to fit into a small purpose made rucksack enabling it to be easily transported to test sites which have only limited or difficult access. It is ideally suited to shipboard use providing both rapid and easy verification of product integrity prior to off-loading.

The kit comprises of 5 key tests that allow go/no go testing of fuels:-

Flashpoint (ASTM D3828) – using the Series 3 Closed cup tester, complete with syringes and portable gas supply. (Note - An external mains power supply is required for this instrument).

Density – An ATEX approved digital density meter.

Conductivity (ASTM D2624) – Using a digital conductivity meter.

Water Content - Shell Water Capsules offer detection to 30ppm (80 tests & syringes).

Digicell – Digital readout of Water content, 100-3000ppm, 200-10000pm and 0-10% (50 tests).

SUPPLIED WITH: syringes, portable gas supply, Shell water capsules, instruction manuals and carry case.

86400-2

SPECIFICATIONS	
Size (HxWxD):	30 x 30 x 30cm
Weight::	6.5kg

ACCESSORIES – Fuel Integrity Test Kit	
OPTIONAL	
13770-311	SYRINGE, 4ml.
CALIBRATION, VERIFICATION & TRAINING	
86000-301	WATER IN OIL REAGENT, (50 tests).
86500-001	SHELL WATER CAPSULES, pack of 160.

CONSUMABLES – Fuel Integrity Test Kit	
86000-301	WATER IN OIL REAGENT, pack A & B, (50 tests).
86500-001	SHELL WATER CAPSULES, pack of 160.

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TEST KITS

86000-3 SETA PORTABLE OIL CONDITION TEST KIT

- Rapid go/no-go testing
- Ready to use
- Five simple to use tests
- Rugged fitted case

A portable kit which allows rapid 'go/no go' checks on in-service oils to evaluate degradation and contamination. Suitable for lubricating oils, crank case, hydraulic, gear, turbine and compressor oils.

Water Content A digital test cell gives a numeric readout of water content when the sample is mixed with two reagents.

Total Base Number The same digital test cell will display the TBN when the sample is mixed with another reagent.

Salt Water Contamination A bottle of reagent and a pack of test pads that change colour in the presence of salt water are provided.

Insoluble Content A pack of blotter spot test sheets is included, allowing visual determination of insoluble content.

Comparative Viscosity A Tri-Gauge comparative viscometer allows the viscosity of the sample to be compared to two standards.

SUPPLIED WITH: beaker, syringes, pipettes, cuvette, tongs and reagents. Also supplied with instructions and a sturdy carry case.

SPECIFICATIONS	
Size (HxWxD):	17 x 47 x 36cm
Weight:	8.1kg

86000-3

CONSUMABLES – Portable Oil Condition Test Kit

86000-301	WATER IN OIL REAGENT, pack A & B, (50 tests).
86000-302	TBN REAGENT, pack C, (50 tests).
86000-303	SALT TEST KIT, pack H, (25 tests).
86000-020	SPOT TEST PAPER, pack of 50.

86200-0 BIODIESEL TEST KIT

- Check for Density, Water, Viscosity and TAN
- Quick, simple and on-the-spot quality assurance
- Gain confidence in biodiesel suitability for use
- Ensure correct storage occurs
- Maintain, optimise and trouble-shoot each stage of manufacture
- Check oil Ester base stocks for quality and acceptability

The Seta Biodiesel Test Kit brings essential quality checks for Density, Water, Viscosity and TAN to where they are most needed. Whether you are an end user or a manufacturer, results are provided in minutes, allowing the correct decisions to be taken at the right time.

As an end user, the quality and batch to batch consistency of the biodiesel can be confirmed. Stored fuel can quickly and easily be checked for degradation, contamination and suitability for use. As a manufacturer, consistent production quality can be achieved. Process optimisation and trouble-shooting can be quickly and effectively monitored and carried out on site in minutes. Ester base stocks can also be checked for suitability at point of delivery.

SUPPLIED WITH: instruction manual and carry case.

86200-0

BIO-FUEL TESTING

SPECIFICATIONS	
Water:	100 - 3000 ppm
Density:	850-950 kg/m³
Viscosity:	1 - 10 cSt @ 40°C
Total Acid Number:	0 - 6 TAN

CONSUMABLES – Biodiesel Test Kit

86200-001	WATER IN OIL REAGENT, pack of 50.
86200-002	TAN REAGENT

86300-0 LEAD IN GASOLINE TEST KIT

- Fully portable and less than 3 minutes per test

The test kit is intended for use in the field by nontechnical people for the quantitative measurement of lead in unleaded gasoline in the range from 0.01 to 0.10g Pb/U.S. gal (2.64 ro 26.4mg Pb/L). This method applies to all commercial gasolines and responds to all types of lead alkyls as well as to other organic and inorganic forms of lead.

SUPPLIED WITH: UV Light and timer, colorimeter, filter and all necessary reagents, glassware and consumbles.

CONSUMABLES – Lead in Gasoline Test Kit

86300-001	REAGENT PACK A, B & C

SULPHUR LAMP METHOD

20410-0 SETA SULFUR LAMP METHOD UNIT

ASTM D1266; D1072; D2384; D2784; IP 107; BS 2000 Part 107; DIN 51 400; NF M07-031; FTM 791 5201

- For sulfur concentrations > 0.002% (20ppm)
- Supports 5 sets of glassware (Seta 20490-0)
- Integral manifolds with valves

An apparatus for determining the total sulfur in liquid petroleum products when in concentrations greater than 0.002% (20ppm) by weight.

The 20410-0 allows simultaneous analysis of up to five samples. The framework that supports the glassware incorporates the air manifold and the suction manifold, all needle valves and the pressure differential control valve.

A complete set of glassware for five simultaneous tests is available as an accessory (Seta 20490-0).

SUPPLIED WITH: instruction manual.

20410-0 (Glassware supplied separately)

SPECIFICATIONS

Size (HxWxD):	48 x 90 x 46cm
Weight:	15kg

ITEMS REQUIRED FOR EACH TEST

Seta No	D1266	D1072	D2784	D2384	IP 107
14010-4		●			
15630-0			●	●	
18550-0			●	●	
20290-4	●	●	●	●	●
20460-2	●		●	●	●
20470-3			●		
20490-0	●	●	●	●	●
20520-0	●			●	●
20540-3		●	●	●	
20550-0	●			●	●
20560-0	●			●	●
20565-0	●			●	●
20570-0			●	●	
20580-0		●			
21520-3				●	
21770-0			●	●	
21790-0			●	●	
21800-0			●	●	
22750-2		●			
IP76C			●	●	

ACCESSORIES - Sulfur Lamp Method Unit

OPTIONAL

Select from the table "ITEMS REQUIRED FOR EACH TEST".

14010-4 VOLUME METER, for measuirng air volume.

15630-0 SETA CHARGING LEAD, high pressure, for connecting sampling cylinder to source. One metre length. Fitted with Hansen high pressure quick-connect couplings, male one end, female the other.

18550-0 SETA TRANSFER DISH, copper, for use with 20540-3 regulating valve, pack of 2.

20290-4 AIR PUMP, (*for details see page 136*).

20460-2 SYNTHETIC AIR UNIT, supplies a mixture of 70% CO_2 and 30% O_2.

Voltage: 110/120V, 50/60Hz
220/240V, 50/60Hz

Power: 460W

Size (HxWxD): 47 x 44 x 26cm

Weight: 17.5kg

20470-5 SETA SINGLE VALVE SAMPLING CYLINDER, 100ml. Maximum working pressure 46 bar (670 lbf/in²).

20490-0 COMPLETE SET OF GLASSWARE, comprising five standard burners with flasks, chimneys, absorbers and splash bulbs, three pressure regulators and two scrubbers and levelling bulbs with interconnecting tubing. (For all methods).

20520-0 COTTON WICK, 500g ball, pack of 2.

20540-3 REGULATING VALVE, with tubing.

20550-0 FLASK, for aromatic samples, pack of 2.

20560-0 BURNER, for aromatic samples, pack of 2.

20565-0 MANIFOLD, with five valves, for aromatic samples.

20570-0 BLAST BURNER, for LPG samples, pack of 2.

20580-0 BLAST BURNER, for fuel gases, pack of 2.

21520-4 SETA DOUBLE VALVE SAMPLING CYLINDER, 50ml capacity. Maximum working pressure 46 bar (670 lbf/in²).

21770-0 SETA RELIEF VALVE, high pressure. Fit to Sampling Cylinder for maximum safety. Set to relieve at 46 bar (670 lbf/in²).

21790-0 SETA QUICK CONNECTION COUPLING, high pressure male Hansen. Fits directly to Sampling Cylinder or Seta Relief Valve.

21800-0 SETA QUICK CONNECTION COUPLING, high pressure female Hansen. Fits directly to 20540-3.

22750-2 DIGITAL STOPWATCH, hand-held, 0.1s resolution (*for details see page 141*).

99100-2 ANALYTICAL BALANCE, (*for details see page 141*).

THERMOMETERS:

IP76C

Note: Other items which may be required include: Titration or photometric equipment. Chemicals, Oxygen, Cardon Dioxide. For ASTM D1072: Purified Air, Flowmeter to measure gas flow rate to burner.

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4 BALL LUBRICANT TESTERS

19900-2 SETA-SHELL 4-BALL EP LUBRICANT TESTER WITH AUTOLOAD SYSTEM

ASTM D2596; D2783; IP 239; IP 300 Procedure A & B (obs); EN ISO 20623; ISO CD 11008; CEC L-45-T-93; (ASTM D2266 & D4172 when used with Wear Loading Kit 19940-0)

- Applied loads range 40 to 800kgF
- Drive speed from 720 to 1900rpm
- Timer range 0.1s to 9999hr
- Torque measurement and limiting
- Full Digital Control
- Digital displays of Applied Load, torque, time
- Safety/splash guard

Determines the friction properties of extreme pressure oils and greases. Used in tribology research laboratories and in the routine quality control of finished lubrication products.

A ball, mounted in a chuck, is rotated against three stationary balls in a pot containing the sample lubricant. The digital speed controller has four programmable presets, three are factory pre-programmed with the most commonly used speeds. A load, adjustable in the range of 40 to 800kgF, is applied to the balls via a balance beam and electric jack. The applied load is displayed on a digital readout. The torque transferred between the rotating and stationary balls is measured and displayed. The digital timer, with a range of 0.1 second to 9999 hours, can be used to control the duration of the test. If the torque exceeds a preset level, or the balls weld during a test power to the drive motor is automatically turned off.

The optional Seta 19940-0 Wear Loading Kit allows the user to quickly convert the equipment into a Four Ball Wear Tester for ASTM D2266 and D4172 tests.

SUPPLIED WITH: 1200 test balls to DIN 5401 and instruction manual.

CALIBRATION & VERIFICATION MATERIALS

SETAPLUS EXTENDED WARRANTY AVAILABLE

TECHNICAL DATASHEETS AVAILABLE

19900-2

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ACCESSORIES – 4 Ball Lubricant Testers

REQUIRED - Elevated Temperatures (ASTM D2266, D4172)

19840-0	SETA HEATING PAD AND CONNECTING LEAD
19850-3	SETA TEMPERATURE CONTROLLER INDICATOR, for 19840-0. **Voltage:** 110/120V or 220/240V, 50/60Hz (switchable)
19860-0	SETA THERMOCOUPLE, for torque arm on standard Seta 19800-5 and also for Rolling and Sliding Contact Torque Arm 19810-0. One required for each torque arm used.

REQUIRED - Viscosity Shear Stability (CEC L-45-T-93)

19820-0	SHEAR STABILITY HEAD, comprises tapered roller bearing and jacket.
19830-3	SETA TEMPERATURE CONTROL SYSTEM, for use with 19820-0, comprises a circulating water bath with fittings for heating and cooling, and a digital indicator. **Voltage:** 110/120V, 50/60Hz 220/240V, 50/60Hz

Note: CEC Reference Fluids available, see Calibration Verification & Training.

Note: Other items which may be required include: Pitting detector, Accelerometer and Time Lapse Recorder (For IP300 only); Solvents.

ACCESSORIES – Cont'd

REQUIRED - Wear (ASTM D2266, D4172) (19900-2 Only)

19940-0	WEAR LOADING KIT, for ASTM D2266 and D4172. Comprises a manual lever arm and weight holder. Supplied with 8 cast iron weights (3 x 1kg, 1 x 500g, 4 x 100g).

OPTIONAL

19750-2	MITUTOYO MICROSCOPE, for x/y linear measurement. Allows direct viewing of ball scar with x30 magnification. **Voltage:** 110/120V or 220/240V, 50/60Hz (switchable)
19870-0	SETA RACK, to hold 120 used balls, prior to wear scar examination.
19895-0	ASTM TEST BALLS, pack of 500 (D2596, D2783, D2266, D4172).
19890-0	SETA TORQUE WRENCH, with socket, set for 50ft.lbf (68Nm). Used for tightening the lock-nut on the ball-holder.
19920-0	TRANSFORMER, for use with 110V, 50/60Hz power supply.
19910-0	CHART RECORDER, (19900-2 only), single channel, 0 to 10V input for continuous torque recording.
99320-2	SETA ULTRASONIC CLEANING BATH, (*for details see page 142*).
45002-0	SETAPLUS EXTENDED 12 MONTH WARRANTY

CALIBRATION, VERIFICATION & TRAINING

19930-0	LOAD VERIFICATION KIT (19900-2 only)

19800-6 SETA-SHELL 4 BALL LUBRICANT TESTER

ASTM D2596; D2266; D2783; D4172; IP 239; IP 300 Procedure A & B (obs); EN ISO 20623; ISO CD 11008; CEC L-45-T-93

- Applied load range 0 to 800kgF
- Drive speed from 720 to 1900rpm
- Digital speed control with four presets
- Timer range 0.1s to 9999hr
- Automatic shut off on seizure
- Safety/splash guard

Similar to 19900-2, but with the load applied to the balls via a balance beam and set of calibrated weights.

As on the 19900-2, the digital speed controller has four programmable presets, three are pre-programmd to the most commonly used speeds. Duration of the test can be controlled by the digital timer, which has four ranges and spans 0.1 second to 9999 hours. If the balls weld during a test, the power to the drive motor is automatically turned off, via a torque sensing mechanism.

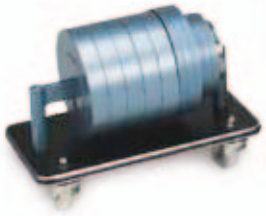
SUPPLIED WITH: a set of 17 cast-iron weights on trolley (6 x 5kg, 3 x 2kg, 3 x 1kg, 1 x 500g, 4 x 100g), 1200 test balls (DIN 5401) and instruction manual.

CALIBRATION & VERIFICATION MATERIALS

SETAPLUS EXTENDED WARRANTY AVAILABLE

TECHNICAL DATASHEETS AVAILABLE

19820-0 Shear Stability Head



19800-6

TEST PARAMETERS

	ASTM D2596	ASTM D2783	ASTM D2266	ASTM D4172	IP239	CEC L-45-T-93
Speed (rpm)	1770 ± 60	1760 ± 40	1200 ± 50	1200 ± 60	1450 to 1500	1475 ± 25
Test Temp (°C)	-	18 to 35°C	75 ± 1.7°C	75 ± 2°C		60 ± 1°C
Time	10 ± 0.2 secs	10 ± 0.2 secs	60 ± 1 min	60 ± 1 min	10 ±0.2 secs or 60 ±0.5 secs or 1 hour	4, 8 and 20 hours
Load (kgF)	6 to 800	6 to 800	40 ± 0.2	15 or 40 ± 0.2	6 to 800	510 ± 20
Measurement	Load Wear Index + Weld Point	Load Wear Index + Weld Point	Scar diameter	Scar diameter	Weld Load (WL) Mean Hertz Load (MHL) Scar Diameter (MSWD) Seizure Load (ISL)	
Product	Lubricating Grease	Lubricating Fluids	Lubricating Grease	Lubricating Fluids	Lubricating Oils	Lubricating Oils (Polymer)

SPECIFICATIONS

Seta Part No:	19900-2	19800-6
Speed Range:	720 to 1900rev/min	720 to 1900rev/min
Load Range:	40 to 800kg	0 to 800kg
Timing:	0.1s to 9999hr	0.1s to 9999hr
Voltage:	220/240V, 50/60Hz	220/240V, 50/60Hz
Power:	1.5kW	1.5kW
Size (HxWxD):	169 x 63 x 62cm	169 x 82 x 62cm
Weight:	150kg	161kg

CONSUMABLES – 4 Ball Lubricant Testers

2 Years/2000 Tests		Qty
19800-002	TEST BALLS, DIN 5401, Pack of 1200	8
19800-024	THRUST RACE - PLUNGER HEAD	1
19800-025	THRUST RACE - BEARING HEAD	1
19800-036	BALL CHUCK	3
19910-001	CHART ROLLS (19900-2 with 19910-0 fitted only)	1

BEARING GREASE TESTERS

19400-3 SETA ROLL STABILITY TESTER

ASTM D1831; MIL-G-10924

- 10 rev/min and 165 rev/min
- Air bath temperature range ambient to 150°C
- Integral timer
- Four test cylinder capacity

The Seta Roll Stability Tester simulates the effect of squeezing grease between the rollers and the outer race of a roller bearing.

Up to four test cylinders, each containing a heavy roller, is loaded with the sample grease and placed horizontally upon a set of drive wheels that rotate the cylinders at either 10 or 165 rev/min. A digitally controlled fan assisted air bath provides evenly distributed heating up to 150°C, and an integral timer is used to set the test duration.

CALIBRATION & VERIFICATION MATERIALS

SETAPLUS EXTENDED WARRANTY AVAILABLE

SPECIFICATIONS	
Bearing rotational speed:	10 or 165 rev/min
Temperature range:	Ambient to 150°C
Voltage:	110/120V or 220/240V, 50/60Hz (switchable)
Power:	1.4kW
Size (HxWxD):	64 x 64 x 41cm
Weight:	45kg

19400-3

SUPPLIED WITH: mains lead and instruction manual.

ACCESSORIES - Roll Stability Tester

REQUIRED

19401-0	THERMOMETER AND COLLAR ASSEMBLY
19420-0	CYLINDER, mild steel, with threaded end cap and smooth finished interiors.
19430-0	ROLLER, 5kg ±50g, for use in Seta 19420-0 (one required for each cylinder).

OPTIONAL

99100-2	ANALYTICAL BALANCE, (*for details see page 141*).
45001-0	SETAPLUS EXTENDED 12 MONTH WARRANTY

CALIBRATION, VERIFICATION & TRAINING

99927-0	DIGITAL THERMOMETER WITH INTERCHANGEABLE PROBES, (*for details see page 130*).
99960-0	DIGITAL PHOTO TACHOMETER, (*for details see page 147*).

Note: Other items which may be required include: Solvent

19610-4 SETA WATER WASHOUT TESTER

ASTM D1264; IP 215; ISO 11009; DIN 51 807; FTM 791 3252

- Bearing speed and water flow fine adjustment
- Jet bypass switch for pre-heat re-circulation
- Easy access drain valve

The test bearing is mounted on a hub, and rotated by an electric motor and toothed belt at 600 rev/min. A peristaltic pump draws heated water from the tank, through a filter, and sprays it, via a 1mm capillary, onto the face of the bearing at a rate of 300ml/min. The temperature of the water is digitally controlled in the range of ambient to 80°C. The water containing washed out grease is collected in the tank, filtered and recycled. A drain tap allows the tank to be emptied at the end of test.

The front panel has controls for water temperature, fine adjustment of water flow rate and bearing rotational speed, and a jet bypass switch to allow pre-heated water to circulate without passing through the jet.

SUPPLIED WITH: a test bearing for laboratory commissioning, 5/32 inch and 2.5mm Allen key screwdrivers, and instruction manual.

CALIBRATION & VERIFICATION MATERIALS

SETAPLUS EXTENDED WARRANTY AVAILABLE

SPECIFICATIONS	
Bearing rotational speed:	600 ±30 rev/min
Tank capacity:	750ml
Temperature range:	Ambient to 80°C
Water flowrate:	5ml/sec
Voltage:	110/120V or 220/240V, 50/60Hz (switchable)
Power:	600W
Size (HxWxD):	30 x 40 x 40cm
Weight:	24kg

19610-4

ACCESSORIES - Water Washout Tester

REQUIRED

19620-0	TEST BALL BEARINGS, pack of 5.

THERMOMETERS:

ASTM34C/IP21C

OPTIONAL

99100-2	ANALYTICAL BALANCE, (*for details see page 141*).
45000-0	SETAPLUS EXTENDED 12 MONTH WARRANTY

CALIBRATION, VERIFICATION & TRAINING

22161-0	RECEIVER, 200ml, graduated, parallel, pack of 3.
22750-2	DIGITAL STOPWATCH, (*for details see page 141*).
99927-0	DIGITAL THERMOMETER WITH INTERCHANGEABLE PROBES, (*for details see page 130*).
99960-0	DIGITAL PHOTO TACHOMETER, (*for details see page 147*).

CONSUMABLES - Water Washout Tester

2 Years/2000 Tests		Qty
19610-201	DRIVE BELT	1
19610-206	TUBING	2m

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FOAM TEST BATHS

14020-5 SETAFOAM DUAL TWIN FOAM TEST BATHS

ASTM D892; IP 146; BS 2000 Part 146; ISO 6247; NF T60-129; FTM 791 3211; JIS K2518

- High and low temperature baths
- Temperature range ambient to 100°C
- Up to two simultaneous tests per bath
- Two pre-heating stations per bath
- Integral flowmeters and regulators
- Two integral normalising coils

A pair of highly transparent water baths for detecting foaming characteristics in lubricating oils, which could cause inadequate lubrication, overflow and cavitation.

The instrument comprises a high temperature (93.5°C) and a low temperature (24°C) bath, each with the capacity to hold four 1000ml graduated glass cylinders. Each bath assembly comprises an inner glass bath contained in a polycarbonate safety vessel, a top mounted thermostir unit and a side mounted module containing two calibrated flowmeters with control valves and protection shields. Integral back-lighting with an opaque reflector aids sample visibility and foam measurements. The low temperature bath also has a cooling coil for use when the ambient temperature exceeds the required bath temperature, and two air normalising coils to cool the air emerging from the high temperature bath test cylinders prior to passing to external volume meters.

The thermostir units provide precision temperature control to within ±0.5°C across a temperature range of ambient to 100°C, and feature a low fluid level alarm. Easy to remove stoppers ensure air tight seals and central location of the diffusers. All air connections are via quick release connectors, and the diffuser tubes can be used with either Mott diffusers or Norton stones.

SUPPLIED WITH: four flowmeters, four graduated 1000ml cylinders and stoppers, interconnection tubing and junctions, mains leads and instruction manual.

Note: Air supply (Seta Air Pump 14019-0) and diffusers required.

CALIBRATION & VERIFICATION MATERIALS

SETAPLUS EXTENDED WARRANTY AVAILABLE

14021-0 Norton Stone

14023-0 Mott Diffuser

SPECIFICATIONS

Outer:	Polycarbonate
Inner:	28 litre, borosilicate glass
No of Baths:	2
No of Cylinders:	4 (2 per bath)
Cylinders:	1000ml, borosilicate glass, graduated
Diffuser:	Mott or Norton Stone
Flowmeters:	2 per bath, 94 ±5ml/min
Control Units:	Thermostir, 1 per bath
Temp range:	Ambient to 100°C ±0.5°C
Supply Voltage:	110/120V, 60Hz 220/240V, 50/60Hz
Power:	3kW
Size (HxWxD):	70 x 48 x 40cm
Weight:	50kg

14020-5 with Accessories

ACCESSORIES - Dual Twin Foam Baths

REQUIRED

One diffuser/stone is required per Graduated Cylinder. Select either;

14021-0 VERIFIED NORTON STONE AND TUBE, porosity and permeability verified.
VERIFICATION CERTIFICATE (Works)

OR

14023-0 VERIFIED MOTT DIFFUSER AND TUBE, stainless steel, porosity and permeability verified.
VERIFICATION CERTIFICATE (Works)

14015-0 DRYING TOWER, 300mm high, for ASTM D892.

14019-0 AIR PUMP AND REGULATOR.
Voltage: 110/120V, 60Hz
220/240V, 50Hz

22750-2 DIGITAL STOPWATCH, hand-held, 0.1s resolution *(for details see page 141).*

THERMOMETERS:

ASTM12C/IP64C or ASTM12F/IP64F

Note: Two required (one for each bath)

Other items which may be required include: Dessicant (Silica Gel); Solvents

OPTIONAL

14020-002 GRADUATED CYLINDER, 1000ml, borosilicate glass, pack of 2.

14020-006 CYLINDER FOOT, to allow the graduated cylinder to stand upright on a bench-top, pack of 2.

14026-0 TEMPERATURE PROBE AND INDICATOR, for monitoring sample temperature.

14029-0 RACK, FOAM CYLINDER, allows vessels to be held for purposes such as draining or cooling, includes drip tray.

14181-2 QUAD LOW TEMPERATURE BATH CONVERSION KIT, to convert from 2 cylinders to 4 cylinders.

14191-2 QUAD HIGH TEMPERATURE BATH CONVERSION KIT, to convert from 2 cylinders to 4 cylinders.

15650-0 WATER PURIFIER, to minimise scale production. Suitable for domestic water supply, 60l/hr max. flow. Comprises disposable cartridge with capacity for 960 litres soft water or 180 litres hard water.

99300-2 MINI LOW TEMPERATURE BATH/CIRCULATOR, to provide chilled water if local supply exceeds 18°C, *(for details see page 139).*

45000-0 SETAPLUS EXTENDED 12 MONTH WARRANTY

CALIBRATION, VERIFICATION & TRAINING

14010-4 SETA VOLUME METER, for measuring the volume of air at 24°C which has passed through one diffuser stone. Tank capacity of 2.5 litres. Note: One required for each simultaneous test.

14028-4 VERIFICATION KIT - FOAM, *(for details see page 103).*

Norton Stone/Mott Diffuser verification service available.

CONSUMABLES - Dual Twin Foam Baths

2 Years/2000 Tests	Qty
14000-002 GRADUATED CYLINDER, pack of 2	2
14020-403 DICHROIC LAMP, pack of 4	1

FOAM TEST BATHS

14028-4 VERIFICATION KIT - FOAM

ASTM D892 Appendix; D6082; IP 146 Appendix; ISO 6247; NF T60-129; JIS K2518

- Verify maximum pore diameter
- Verify permeability
- Suitable for Mott Diffusers and Norton Stones

An apparatus to quickly verify the maximum pore diameter and permeability of Mott diffusers and Norton stones used in foam baths.

Comprising an air pump, a test selector valve, two air control regulators, glassware, digital manometer and a flowmeter, all mounted on a chassis with the necessary manifolds and interconnecting tubes.

For pore diameter verification the test selector valve directs air via the 'porosity' air control regulator to the diffuser/stone, which is immersed in water in a 250ml glass measuring cylinder. The digital manometer reads the air pressure required for a bubble to appear at the diffuser/stone.

During permeability verification the test selector valve directs air via the 'permeability' air control valve to the diffuser/stone which is in a 250ml Buchner flask, the outlet of which is connected to the flowmeter. The flowmeter shows the airflow when the digital manometer shows a specified air pressure upstream of the diffuser/stone.

SUPPLIED WITH: air pump, glassware, manometer, flowmeter, all necessary tubing, mains lead and instruction manual.

14028-4 (Mott Diffuser not supplied)

CALIBRATION CERTIFICATE (UKAS) - MANOMETER & FLOWMETER

ACCESSORIES - Verification Kit - Foam

REQUIRED

22750-2	DIGITAL STOPWATCH, hand-held, 0.1s resolution, *(for details, see page 141).*

CONSUMABLES - Verification Kit - Foam

2 Years/2000 Tests		Qty
14028-202	FLASK, 250ml, glass	1
14028-203	CYLINDER, 250ml, glass.	1
16720-002	SILICONE RUBBER TUBE, 5m.	1

SPECIFICATIONS

Voltage:	110/120V, 60Hz 220/230V, 50/60Hz
Power:	300W
Size (HxWxD):	60 x 45 x 28cm
Weight:	8.6kg

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DEMULSIFICATION

16500-0 SETA DEMULSIFICATION APPARATUS

IP 19; BS 2000 Part 19; DIN 51 589-1; NF T60-156

Comprises a glass bodied steam generator, emulsifying bath, separating bath and oil container.

SUPPLIED WITH: steam piping, auxiliary steam line, screw clips, connecting tubes and instruction manual.

16500-0 (Stand & clamp supplied separately)

SPECIFICATIONS

Size (HxWxD):	45 x 35 x 35cm
Weight:	3kg

ACCESSORIES - Demulsification Apparatus

REQUIRED

10720-0	SETA BURNER, for coal gas.
	OR
10740-0	SETA BURNER, for LPG.
	OR
10750-0	SETA BURNER, for natural gas (Methane).
	OR
25000-3	SETA-HOT, 1000W electric heater with variable heat control, *(for details see page 137).*
24500-0	SETA STEEL STAND
24520-0	CLAMP, 2 to 90mm diameter capacity.
24650-2	BOSSHEAD, to fit 24520-0.

THERMOMETERS:
IP3F or IP3C.

OPTIONAL

22750-2	DIGITAL STOPWATCH, hand-held, 0.1s resolution, *(for details see page 141).*

AIR RELEASE

15850-4 SETA AIR RELEASE VALUE APPARATUS

ASTM D3427; IP 313; BS 2000 Part 313; DIN 51 381; ISO 9120; NF T60-149

- Ambient to 75°C temperature range
- 200kPa maximum air pressure
- 23l/min maximum flow rate
- Optional automated density monitoring

15850-4 and 15880-6 Balance (supplied separately)

Determines the time taken for hydraulic fluids and lubricating oils to release entrained air and gases.

The main unit comprises an air heater, fine control pressure regulator, pressure gauge, and mounting clip for the test vessel. An interlocked 3 pin socket provides power to an external air pump (not supplied) when the heater is on. The digital temperature controller is housed in a separate unit. The instrument is protected by an overtemperature cut-out.

An automated density balance (Seta 15880-6) is available as an accessory.

SUPPLIED WITH: connection tubing, digital temperature control unit, mains lead and instruction manual.

Note: Requires connection to a suitable air supply and a Density Balance.

SETAPLUS EXTENDED WARRANTY AVAILABLE

SPECIFICATIONS	
Max. Air Temperature:	85°C
Sample Temp. Range:	Ambient to 75°C
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Power:	170W
Size (HxWxD):	46 x 38 x 35cm
Weight:	8.5kg

ACCESSORIES - Air Release Value App.

REQUIRED

15870-4	CIRCULATING WATER BATH, *(see below).*
20290-4	AIR PUMP, *(for details see page 136).*
15860-0	SETA TEST VESSEL, glass, comprises a jacketed sample tube, matched air inlet capillary, baffle plate and air outlet tube.
15865-0	DIGITAL THERMOMETER AND THERMOCOUPLES, for monitoring sample temperature.
16125-0	DIGITAL THERMOMETER AND PROBE, for measuring air inlet temperature before the test.
15880-6	DENSITY BALANCE, *(see below).*
99200-2	LABORATORY OVEN, for warming test sample, *(for details see page 137).*

OPTIONAL

45000-0	SETAPLUS EXTENDED 12 MONTH WARRANTY

15880-6 SETA DENSITY BALANCE

ASTM D3427; IP 313; BS 2000 Part 313; DIN 51 381; ISO 9120; NF T60-149

15880-6

- Optimised for use with Seta Air Release Value Apparatus
- Automatic density calculation
- ±0.001g/ml resolution

The Seta Density Balance comprises an electronic balance with a 10ml glass sinker, platinum wire and Seta-ARV software.

The software monitors the output of the balance, calculates the density of the sample prior to and during the test, and determines the time taken for the sample to reach the target density.

SUPPLIED WITH: Seta ARV software, platinum wire, glass sinker, stand, connecting cable, mains lead and instruction manual.

Note: Requires connection to a compatible personal computer (not supplied).

SPECIFICATIONS	
Resolution:	± 0.001g/ml
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Size (HxWxD):	7 x 24 x 27cm
Weight:	7kg

CONSUMABLES - Density Balance

2 Years/2000 Tests		Qty
15880-201	SINKER, 10ml, glass	1
15880-202	WIRE, 160mm, platinum	1

SOFTWARE INCLUDED

CALIBRATION CERTIFICATE (WORKS)

15870-4 CIRCULATING WATER BATH

15870-4

- Temp range ambient +5°C to 120°C
- Integral stirrer
- Over-temperature and low liquid level protection
- 12 litre bath

A compact thermostatic bath, digitally controlled to an accuracy of ±0.1°C across a temperature range of ambient +5°C to 120°C with a stirrer to ensure even temperature distribution. The unit is equipped with over-temperature and low liquid level protection devices.

SUPPLIED WITH: mains lead and instruction manual.

SPECIFICATIONS	
Temperature Range:	Ambient +5°C to 120°C
Temperature Stability:	± 0.1°C
Volume:	12 litres
Voltage:	110/120V, 50/60Hz 200/240V, 50/60Hz
Power:	1.4 KW
Size (HxWxD):	35 x 35 x 33cm
Weight:	12.5kg

ACCESSORIES - Water Bath

OPTIONAL

15875-0	C&P TEST JAR HOLDER, holds 10 35mm tubes.

EMULSIFICATION

96700-0 HERSCHEL EMULSIFIER X3

ASTM D1401

- 3 position semi-automatic instrument
- Integral backlighting for improved precision
- 54/82°C ±1°C
- 3 stirrers - independently controlled
- Programmable test and measurement time

The Herschel Emulsifier is a three station Herschel Emulsifier for testing the water separability of petroleum oils and synthetic fluids using the ASTM D1401 test method. The bath can be operated at either 54°C or 82°C. The three test stations operate independently of each other in a common bath. The stirrer for each test station rotates at a fixed speed of 1500rpm, and is lowered or raised automatically. Audible prompts advise the user when to take measurements and also signify the end of the test. The interval between audible prompts and the total duration of the test are programmable.

SUPPLIED WITH: 3 glass cylinders, mains lead and instruction manual.

SPECIFICATIONS	
Bath Temperature Range:	54°C and 82°C (switchable)
Bath Capacity:	4 litres (approx)
Temperature Stability:	±1°C @ 54°C, ±1°C @ 82°C
Number of Test Stations:	3
Voltage:	220/240Vac, 50Hz
Power:	600W
Size (HxWxD):	82 x 44 x 33cm (approx)
Weight:	30kg (approx)

96700-0

96600-3 HERSCHEL EMULSIFIER

ASTM D1401; IP 412; ISO 6614; NF T60-125

- 5 test and 2 pre-heat positions
- Consistent emulsification conditions
- 25 to150°C temperature range
- 50 to1800 rev/min variable speed stirrer
- RS232 interface

A heated bath with stirrer to allow water and a test sample to be emulsified consistently, prior to measuring the time taken for separation to occur.

The unit accommodates up to seven test vessels (five working and two sample pre-heat positions) in an oil bath. The bath is heated to and maintained at any set temperature between 25 and 150°C. The unit is a combined heater and re-circulating pump, with digital temperature control and display, RS232 interface for connection to a personal computer, and over-temperature and low fluid level warning devices.

The stirrer head can be rotated over each test vessel in turn, and is locked accurately in position by a detent pin. The stirrer head houses a motor and variable speed controller, with a range of 50 to 1800 rev/min, and a digital tachometer. The stirrer control unit incorporates a digital timer and display, and provides power to the stirrer head and the heater unit.

SUPPLIED WITH: mains lead and instruction manual.

SPECIFICATIONS	
Voltage:	110/120V, 60Hz 220/240V, 50Hz
Power:	2050W (220V version) 1550W (110V version)
Size (HxWxD):	74 x 40 x 35cm
Weight:	19kg

96600-3

ACCESSORIES - Herschel Emulsifier

REQUIRED

94632-0 SILICONE OIL, 20 litres, for filling bath, for use up to 150°C.
OR
94633-0 BATH OIL, 20 litres, for filling bath, for use up to 100°C.
96511-0 GLASS CYLINDER, borosilicate glass, 100ml graduated (7 required).

THERMOMETERS:
ASTM 19C; 19F; 21C; 21F

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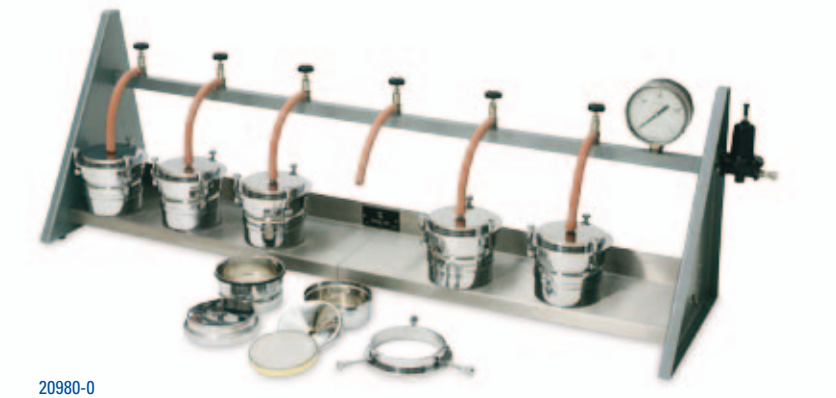
GREASE SEPARATION APPARATUS

20980-0 SETA GREASE SEPARATION APPARATUS



20980-0

ASTM D1742; FTM 791 322

- Six cell capacity

Comprises six pressure bleeding test cells Type B (see Seta 20990-0) with combined rack and pressure manifold, complete with control valve, regulator and air pressure gauge.

SPECIFICATIONS	
Size (HxWxD):	42 x 140 x 35cm
Weight:	20kg

20990-0 SETA PRESSURE BLEEDING TEST CELL TYPE B

20990-0

ASTM D1742; FTM 791 322

Comprises a tightly fitting cap and cover which contains a 75µm (No. 200) sieve strainer, a funnel for collecting separated oil and a 25ml beaker for retaining the oil.

SPECIFICATIONS	
Size (HxDia):	15 x 15cm

20900-0 SETA GREASE SEPARATION APPARATUS

20900-0

IP 121; BS 2000 Part 121; DIN 51 817; DEF 222A CS 3107

Comprises a stainless steel separation cup with integral metal gauze cone, 100g stainless steel weight and an oil cup.

SPECIFICATIONS	
Size (HxDia):	5 x 6cm

20950-0 SETA GREASE SEPARATION APPARATUS

20950-0

DEF STAN 05-50/01 Method 9

Comprises a 24 mesh/cm stainless steel gauze cone, a neoprene-lined beaker cover, and a lipless beaker.

SPECIFICATIONS	
Size (HxDia):	10 x 6cm

ACCESSORIES – Grease Separation Apparatus (All types)

OPTIONAL

99100-2 ANALYTICAL BALANCE, *(for details see page 141).*

20800-0 SETA OIL CONTENT OF WAX APPARATUS

ASTM D721; D3235; IP 158; ISO 2908; NF T60-120; FTM 791 5431

- Temperature controlled hot air Evaporation Unit
- Four 15ml bottle capacity
- Rack and pinion operated air tubes
- Three filter stick capacity Cooling Bath
- Kerosine/Solid CO_2 cooling medium

The content of oil and solvents in waxes affect the melting point, hardness and other properties.

The Seta Oil Content of Wax Apparatus comprises a cooling bath for three filter stick assemblies and a temperature controlled hot air evaporation assembly to hold four 15ml weighing bottles.

Note: Air pump (Seta 14030-2 recommended) required.

20800-0

SETAPLUS EXTENDED WARRANTY

SPECIFICATIONS

Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Power:	65W
Heat Lamps:	60W, Tungsten Filament (BC)
Air Flowrate:	2-3 litre/min, per jet
Cooling Bath Capacity:	1.25 litre, total
Cooling Medium:	Kerosine and solid CO_2
Size (HxWxD):	28 x 27 x 39cm (Cooling Bath) 21 x 21 x 27cm (Evaporation Unit)
Weight:	8.4kg

CONSUMABLES - Oil Content of Wax Apparatus

2 Years / 2000 Tests		Qty
20480-009	SPRING, pack of 20	1
20850-001	AIR PRESSURE REGULATOR, pack of 2	1
20850-004	WEIGHING BOTTLE, 15ml, pack of 4	1
20850-005	FILTER STICK/COOLING TUBE, pack of 2 pairs	4

ACCESSORIES - Oil Content of Wax Apparatus

REQUIRED

20850-0	GLASSWARE, comprises air pressure regulator, filter stick and cooling tube with two assembly springs, and four 15ml weighing bottles.

THERMOMETERS:
ASTM71F/IP72F; ASTM71C/IP72C

OPTIONAL

	DRY ICE MAKERS, (*for details see page 140*).
14030-2	AIR PUMP, vacuum and pressure, oil-free, (*for details see page 136*).
99100-2	ANALYTICAL BALANCE, (*for details see page 141*).
45000-0	SETAPLUS EXTENDED 12 MONTH WARRANTY

Note: Other items which may be required include: Pipettes, Wire stirrer.

OIL TEST CENTRIFUGE

90000-3 SETA OIL TEST CENTRIFUGE

ASTM D91; D96 (obs); D893; D1290; D1796; D1966; D2273; D2709; D2711; D4007; D5546; IP 75 (obs); IP 359; BS 2882 (obs); ISO 3734; ISO 9030; FTM 791: Methods 3000; 3003; 3004; 3101; 3121; 5661; DIN 51 793; NF M07-020; API 2542; API 2548; API MPMS Chapter 10.3

- Specifically designed for testing oils
- Heated chamber, ambient to 80°C
- 4 place swing out rotor
- Microprocessor control with 99 programme memory
- Membrane 'touch' control panel
- Pre-heat facility to ensure bowl is at test temperature prior to test
- Universal buckets for 12.5ml, 6 and 8 inch glassware
- Static, near vertical bucket positioning
- Conforms to safety requirements IEC 1010-1; 1010-2-D
- Optional 'Setafuge' Hazard Reduction System
- Optional trolley

Seta Oil Test Centrifuge is a microprocessor controlled, heated centrifuge manufactured exclusively for Seta by Hermle Labortechnik. The instrument is fully programmable allowing automatic configuration to the specified oil test parameters.

A four place swing out rotor and universal bucket assembly accommodates low cost adaptors and cushions suitable for borosilicate glass centrifuge tubes of the types specified for oil testing: 6 or 8 inch conical, 8 inch trace sediment, 8 inch pear-shaped or 12.5ml. To reduce errors in measurement of tube content, the rotor design allows tubes to stand in a near upright (vertical) position at rest.

Speed, temperature, and timing are microprocessor controlled and run parameters are entered via the panel controls and digital displays.

Speed can be specified and measured in either RPM (rotational speed) or RCF (relative centrifugal force) mode and 99 run profiles can be stored in memory. The run duration can be set between 10 seconds and 100 hours in 10 second and one-minute increments, or set for continuous operation. Acceleration and braking time are user adjustable.

A controlled isothermal band heater holds the temperature between 30 and 80°C, and is programmed to compensate for friction heating effects during operation thus ensuring correct sample temperatures throughout the test.

A brushless asynchronous motor ensures high reliability with low maintenance and the centrifuge has in-built error messaging diagnostics.

SAFETY features include a motor driven lid latch with a safety interlock to prevent centrifuge operation while the lid is unlocked, imbalance detection, and over-temperature protection for both the motor and the chamber. The centrifuge is almost silent in operation with measured noise levels below 55 dB (A). Two types of trolleys are available as optional accessories to allow easy movement of the instrument. The centrifuge meets the safety requirements of BS 4402, DIN 58970, IEC 1010-1; IEC 1010-2-D; pr EN 61 010-1 & 61 010-2; BGR 500; Chapter 2.11; Part 3; UVV VBG 4 and VDE 0871.

SUPPLIED WITH: rotor, buckets, and cushions.

Note: Bucket adaptors and tubes should be selected from the method table according to test method requirements.

BIO-FUEL TESTING

90000-3

Oil Test Tubes and Bucket Adaptors

SPECIFICATIONS

Maximum Relative Centrifugal Force (RCF):	2214g
Maximum Rotational Speed:	3000 rev/min
Temperature Range:	30 to 80°C (switchable °F), ±1°C at 60°C
Timer Range:	10 sec to 100 hours or continuous operation
Control:	Microprocessor with 99 memory capacity
Capacity:	4 Samples
Voltage range:	220/240V, 50/60Hz (Optional transformer for 110/120V)
Power:	950W
Size (HxWxD):	40.1 x 56.4 x 63.9cm
Weight:	72.5kg

CENTRIFUGE ACCESSORIES

ITEMS REQUIRED FOR EACH TEST									
SETA No	**D91**	**D96**	**D893**	**D1796**	**D2273**	**D2709**	**D2711**	**D4007**	**D5546**
90040-0	●	●	●	●			●	●	●
90050-0						●			
90060-0					●	●			
90011-0		●							
90012-0		●							
90010-0	●	●	●	●	●	●	●	●	
90001-2	●	●	●	●	●	●	●	●	●
90002-0		●							
90003-2						●			
90005-2		●							
90041-2	●	●	●	●	●	●	●	●	●
90202-2		●							
90203-2	●	●	●	●	●	●	●	●	
90204-2						●			
90200-4 or 90300-2 & 90301-0	●	●	●	●	●	●	●	●	
Relative Centrifugal Force (rcf):									
90040-0	600-700 x g	500 x g	600-700 x g	500-800 x g			700 x g	600 x g	700 x g
90050-0						800 x g			
90060-0					600-700 x g	800 x g			
90011-0		500 x g							
Sample Pre-heat Temp.	32 to 35°C	60 ±3°C †	60 ±5°C	49 ±1°C or 60 ±1°C	32 to 35°C		82 ±1°C	60 ±3°C	25 ±1°C
Test Temp.	Unheated	60 ±3°C	Unheated	60 ±1°C	Unheated	21 to 32°C	60 ±1°C	60 ±3°C	Unheated
Test Time	10 mins	5 mins	20 mins	10 mins	10 mins	10 mins	10-15 mins	10 mins	10 mins

† Sample must be 52°C or above after test

CONSUMABLES – Oil Test Centrifuge

2 Years / 2000 Tests		Qty
90000-301	BOTTOM INSERTS, (pack of 2)	8

ACCESSORIES – Oil Test Centrifuge

REQUIRED

Refer to the table of "ITEMS REQUIRED FOR EACH TEST" and select from the following options:

90001-2	ADAPTOR, for 90040-0/90060 glassware, pack of 4.
90003-2	ADAPTOR, for 90050-0 glassware, pack of 4.
90005-2	ADAPTOR, for 90011-0 glassware, pack of 4.
90002-0	ADAPTOR, for 90012-0 glssware, pack of 4.
90011-0	TUBE, 100ml cone-shaped, 6 inch, graduated to 0.05ml, pack of 6.
90040-0	TUBE, 100ml cone-shaped, 8 inch, graduated to 0.05ml, pack of 6.
90050-0	TUBE, 100ml pear-shaped, 8 inch, tip graduated to 0.01ml over the range 0 to 0.2ml, pack of 6.
90060-0	TUBE, 100ml trace-sediment, 8 inch, tip graduated to 0.005ml over the range of 0 to 0.01ml, pack of 6
90012-0	TUBE, 12.5ml, pack of 6.
Note:	*Other items which may be required include: Funnel, Demulsifier, Solvents, Pipette, Stirrer, Desiccator.*

OPTIONAL

90010-0	'SETAFUGE' HAZARD REDUCTION SYSTEM
90014-0	LOW TROLLEY, with lockable castors, 68cm high with centrifuge.
90015-0	HIGH TROLLEY, with lockable castors, 99cm high with centrifuge.
90016-0	TRANSFORMER, for 110/120V 60Hz operation.
90200-4	WATER BATH, 15 litre capacity, ambient to 100°C, for pre-heating samples (alternative to 90300-2). **Voltage:** 110/120V, 60Hz; 220/240V, 50Hz
90300-2	SETA BLOCK HEATER, to dry heat tubes *(requires 90301-0 BLOCK for details see below).*
90301-0	BLOCK, aluminium, holds four 90040-0/90060-0 tubes for use with 90300-2 Block Heater.
90202-2	RACK, 5 place for 90011-0 tubes.
90203-2	RACK, 6 place for 90040-0/90060-0 tubes.
90204-2	RACK, 4 place for 90050-0 tubes.
90041-2	STOPPERS, pack of 50.
99100-2	ANALYTICAL BALANCE, for ASTM D893, *(for details see page 141).*

90010-0 'SETAFUGE' HAZARD REDUCTION SYSTEM

- Vapour extraction and dilution
- Reduced chamber pressure to prevent vapour seepage
- Safety interlock

'SETAFUGE' significantly reduces the hazards associated with vapours and gases released from volatile samples and samples with added solvents in centrifuges at elevated temperatures.

Vapours are extracted from near the top of the chamber, diluted with air, and discharged safely, via a tube, to a non-hazardous area. By maintaining the chamber at slightly below atmospheric pressure, escape of vapour into the laboratory environment is prevented.

A vacuum switch continuously monitors the vacuum inside the chamber and the unit interfaces with the centrifuge interlock to ensure that safe procedures are always followed.

Note: Requires an external compressed air supply.

SPECIFICATIONS	
Size (HxWxD):	18 x 13 x 12cm
Weight:	2kg

90300-2 SETA BLOCK HEATER

- Dry heating for samples
- 15°C to 130°C
- 4 tube capacity
- 9999 minute timer

90300-2 with 90301-0 Block and 90060-0 Tube

A processor controlled heater designed to be used in conjunction with a 90301-0 Block for heating centrifuge tubes. The heater has a temperature range of 15 to 130°C.

The heater is equipped with a 1 to 9999 minute countdown timer with buzzer, a temperature deviation alarm that can be set from 0.5 to 10°C allowable deviation, an external temperature probe socket, and a delay start stop feature allowing the heater to be turned on or off after a predetermined time interval.

The heater can be calibrated by the user over a wide temperature range.

SUPPLIED WITH: block extractor tool, mains lead and instruction manual.

Note: Block 90301-0 required, see accessories.

ACCESSORIES – Block Heater

REQUIRED

90301-0	BLOCK, aluminium, holds four 90040-0 or 90060-0 tubes.

SPECIFICATIONS	
Temp range:	15°C to 130°C
Stability:	±0.1°C
Timer Range:	1 to 9999 mins
Heater Power:	200W @110V 300W @240V
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Size (HxWxD):	10 x 20 x 28cm
Weight:	3kg

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Advanced Engine Technology Ltd.

92000- 3 IGNITION QUALITY TESTER (IQT™)

EN 15195: 2005(E); ASTM D6890; IP 498;

Specifications EN 590; ASTM D975; D6751; D7467; BS 2869

Correlates with ASTM D613

- Automated test procedure
- Precise results - Repeatability of 0.92, Reproducibility 2.69 @ 52 CN
- Optimise refinery blending
- Tighter control of cetane additives
- Minimize 'give away'
- Small (<100ml) sample size
- Fast analysis (<20 mins)
- Durable tough instrument (some instruments have 20,000 tests)
- Fully approved and specification compliant
- Suitable for use with B100

The Ignition Quality Tester (IQT™) is a reliable, affordable, more precise, and quiet alternative to a cetane engine. It is a fully automated test instrument for deriving the cetane number for a wide range of middle distillate fuels including conventional and oil sands-based diesels, biodiesels, refinery streams, plus fuels using oxygenate and nitrate based cetane enhancers.

Significantly smaller and quieter than a traditional cetane engine, the IQT™ requires less infrastructure, uses compressed gases that are readily available in cylinders throughout the world, and is designed for an industrial laboratory type environment. The IQT™ automatically carries out all pre-test and test procedures, analyses the data and presents the results in under 20 minutes.

The combustion chamber, injection system and fuel/gas metering systems are mounted on a sturdy chassis attached to the top of a wheeled cabinet. The cabinet also contains the associated coolant system and an integral computer with the IQT™ System Software (ISS™) installed. An easy to view flat screen colour monitor is mounted on an adjustable arm attached to the cabinet. An electronics cabinet, containing data aquisition and instrumentation circuitry and the control system, is mounted on the side of the wheeled cabinet.

Manufactured by Advanced Engine Technology (AET) in Canada, the IQT™ determines the delay between the injector needle lifting and the combustion pressure recovery point in a heated fixed volume combustion chamber. This delay is highly correlated to the ASTM D613 cetane number (CN). The IQT™ is connected to a Nitrogen supply for delivering the sample, an Air supply to operate the injector, and a 20.9% O_2 content Air supply for the combustion charge. The combustion chamber is electrically heated.

The IQT™ package comprises the Ignition Quality Tester, cooling system, wheeled cabinet, electronics cabinet, rugged industrial computer, software, monitor, connecting cables, flexible hoses for connection to the gas supplies, and a toolkit. Please refer to the accessories table for additional kits required for installation and operation.

92000-3

BIO-FUEL TESTING

SOFTWARE INCLUDED

CALIBRATION & VERIFICATION MATERIALS

TECHNICAL DATASHEETS AVAILABLE

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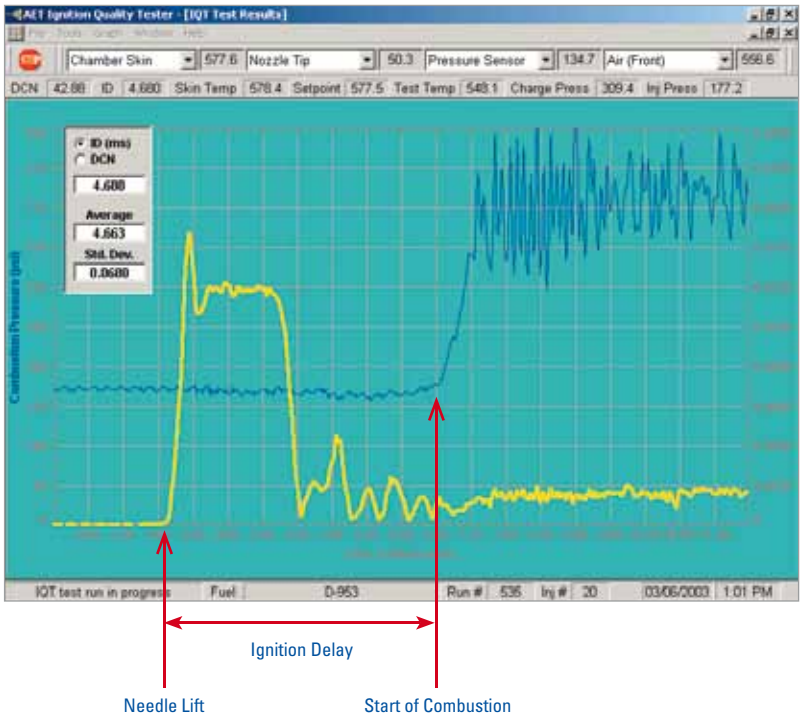
SPECIFICATIONS

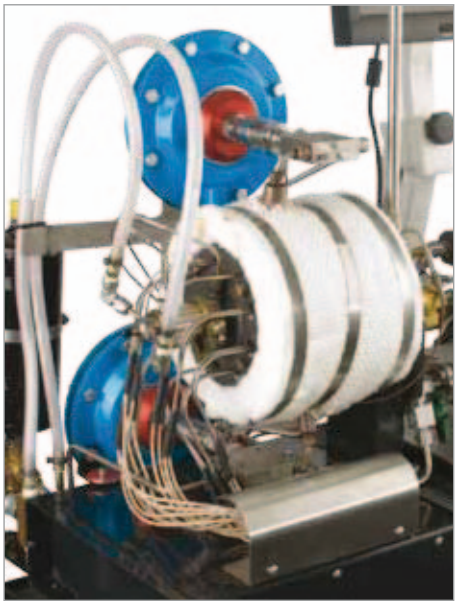
Measuring Principle:	Constant Volume Combustion Chamber
Injection System:	Pintle-type, single hole nozzle, air-driven injection pump
Combustion Air Supply:	Compressed air, 20.9% O_2, ±1.0%
Regulated minimum:	21.7 bar (310 psi) for Combustion process
Air Supply:	Compressed air, Industrial Grade
Regulated minimum:	12.1 bar (175 psi) for Injection process
Nitrogen Supply:	Compressed Nitrogen, Industrial Grade
Regulated minimum:	3.5 bar (50 psi) for Fuel Feed process
Cooling System:	Closed-loop liquid to air
Computer (supplied):	32 bit Windows Based Industrial Computer
Input voltage:	120/220V, 60 Hz 220/240V, 50Hz Protected by an uninterruptable power supply (UPS) and isolating transformer
Typical Footprint:	3 x 3 x 3m
Typical Weight:	300kg

Stanhope-Seta are distributors for the Ignition Quality Tester in Europe and India.

In addion to the supply of the IQT™ equipment, Stanhope-Seta also offer a comprehensive set of support packages including site preparation, IQT™ installation and commissioning.

Stanhope-Seta can also provide basic and advanced staff training and maintenance workshops on-site and at our UK headquarters.





Combustion Chamber detail

ACCESSORIES - IQT™

REQUIRED

92002-0	SERVICE SPARES KIT, comprising exhaust valve, injector nozzle, gaskets and 'O' rings, combustion chamber heater, bleed valve for injection pump, thermocouple set, combustion pressure transducer.
92007-3	START UP KIT, comprising waste product and coolant overflow containers, sample containers and filtering kit, wash bottles and containers, fume extraction system adaptor and trunking, gas supply adaptors, laser printer, computer trolley, and additional tools.
92008-6	CALIBRATION KIT, comprising nozzle opening pressure (NOP) calibrator, mass calibration kit (92000-010), digital thermometer, calibration materials.
92010-2	POWER SUPPLY KIT, with auto shut down system, comprises uninterruptible power supply (3 hours), isolating transformer, combustion chamber over-temperature cut-out switch, cables and connectors.
92020-3	GAS REGULATOR KIT, comprising a set of delivery panels (cylinder/supply end) and point of use panels (IQT end) for the nitrogen and two air supplies. Each panel includes all required regulators, valves, filters gauges and adaptors, assembled and ready to mount.
TRIQTI	INSTALLATION, COMMISSIONING & TRAINING, IQT installation and commissioning, local training of staff.

OPTIONAL

92009-2	EXTRACTION FAN SYSTEM, for positive fume extraction.
TRIQTM	ADVANCED WORKSHOP & MAINTENANCE TRAINING, in depth training including advanced maintenance and repair work at Stanhope-Seta in the UK.
TRIQTS	SERVICE CONTRACT, Scheduled maintenance, tailored to client needs (ad-hoc or annual contracts available).

COLORIMETERS

Colorimetry is the measurement of colour. Variations in the colour of a product can indicate differences in its purity, composition or deterioration. Seta-Lovibond colour comparators offer a choice of instruments suitable for all major colour test methods. The instruments are simple to use and eliminate the subjective assessment of colour associated with visual comparisons.

- Automatic operation
- Multiple colour scales including ASTM and Saybolt
- Rapid measurement < 25 seconds
- Objective colour measurement
- RS232 interface
- Integrated remote calibration

15260-4

15260-4 SETA MULTICOLOUR AUTOMATIC COLORIMETER

ASTM D156; D1209; D1500; D5386; D6045; E308; IP 196; ISO 2049; ISO 2211; BS 2000 Part 196; BS 5339; BS 5859; FTM 791 102; DIN 51 411; NF T60-104; NF M07-003; JIS K2580

SOFTWARE INCLUDED

CALIBRATION & VERIFICATION MATERIALS

An automated spectrometric colorimeter designed for rapid colour analysis of petrochemical products, the 15260-4 is selectable for Saybolt, ASTM, Pt-Co/Hazen/APHA, spectral data and CIE colour determinations.

Parameters are entered via a menu system, and subsequent testing is initiated by a single key press with results available within 25 seconds. Up to 32 results can be stored in the on-board memory. The instrument can also be controlled and data processed on an IBM compatible personal computer using the software provided.

SUPPLIED WITH: software, 33mm optical glass cell, 50mm optical glass cell, ASTM Colour 3.5 certified glass conformance filter, spare lamp, universal power supply and instruction manual.

15320-2 SETA-LOVIBOND HIGH PRECISION COLORIMETER

ASTM D156; D1209; D1544; D1500; D6045; IP 17 Method A & B; IP 196; BS 5339; BS 5859; ISO 2049; DIN 51 411; NF M07-003; JIS K2580

15320-2

SOFTWARE INCLUDED

CALIBRATION & VERIFICATION MATERIALS

The 15320-2 is a high precision version of the 15260-4 Seta Multicolour Automatic Colorimeter. The instrument provides determinations in Saybolt colour, ASTM Colour, Pt-Co/Hazen/APHA Colour, Gardner Colour, Lovibond RYBN, IP Units, CIE values or spectral data.

An integral heater unit allows samples such as waxes to be maintained in a liquid state.

SUPPLIED WITH: software, 10mm, 100mm, 1 inch and 6 inch optical glass cells (one of each), Saybolt +10 calibrated glass conformance filter, spare lamp, universal power supply and instruction manual.

Method	Colour Scale	15260-4	15320-2	Notes
ASTM D1500; D6045	ASTM Colour	0.5 to 8 Units	0.5 to 8 Units	Lubricating, heating and diesel fuel oils
ASTM D156; JIS K2580	Saybolt Colour	-16 (Darkest) to +30 (Lightest)	-16 (Darkest) to +30 (Lightest)	Light Coloured: Aviation Fuels, kerosenes, white mineral oils
ASTM D6045	Saybolt Colour	0 to 30	0 to 30	
ASTM D1209; D5386	Pt-Co/Hazen/APHA	0 to 500mg Pt/l	0 to 500mg Pt/l	Clear Liquids: Solvents, petroleum spirits, water
ASTM D1544; D6166	Gardner Colour	1 to 18 Units	1 to 18 Units	Pale Yellow to Red Liquids: Resins, varnishes, fatty acids
	Lovibond RYBN		R & Y = 0 to 70, B = 0 to 40, N = 0 to 3.9	
ASTM E308	CIE Values	Defined by spectrum locus		
Spectral Data (420 to 710nm)	Transmittance Optical density	0 to 100% 0 to 2.5	0 to 100% 0 to 2.5	Full spectrum and specified wavelengths Full spectrum and specified wavelengths

COLORIMETERS

SPECIFICATIONS

Seta Part No:	15260-4	15320-2
Measuring Principle:	9 interference filters	16 interference filters
Spectral Response:	420 to 710nm	
Bandwidth:	20nm	20nm
Repeatability **Chromaticity: (x,y)** **Transmittance:** **Saybolt Values:**	 ±0.0004 ±0.5%	 ± 0.0002 ± 0.25% ± 1
Measurement times:	Less than 25 seconds	
Calibration:	Single key press, fully automated	
Light Source:	5V, 10W tungsten halogen lamp	
Illuminants:	CIE Illuminant A, B, C, D65	
Observers:	2°, 10°	
Path Length:	0.1 to 50mm	0.1 to 153mm
Heater Unit:	N/A	95°C Max
Interface:	USB, LAN, RS 232 port	
Data storage:	32 Data sets	
Input voltage:	Universal via external power supply unit	
Display:	240 x 128 character back lit LCD	
Keypad:	23 key membrane keypad, washable polyester, with audible feedback	
Instructions:	9 languages - English, French, German, Italian, Spanish, Portuguese, Russian, Chinese and Japanese	
Size (HxWxD):	17 x 20 x 44cm	17 x 52 x 20cm
Weight:	7kg	8kg

ACCESSORIES - Seta Colorimeters

OPTIONAL - Multicolour Automatic

15262-0 GARDNER COLOUR SCALE

CALIBRATION, VERIFICATION & TRAINING - Multicolour Auto.

SETA CERTIFIED COLOUR STANDARDS, *(for details see page 114).*

CALIBRATION, VERIFICATION & TRAINING - High Precision

SETA CERTIFIED COLOUR STANDARDS, *(for details see page 114).*

15301-0 ASTM COLOUR CONFORMANCE FILTERS, set of 3, *(for details see page 114).*

15302-0 SAYBOLT COLOUR CONFORMANCE FILTERS, set of 5, *(for details see page 114).*

CONSUMABLES - Seta Colorimeters

2 Years/2000 Tests - Multicolour Automatic		Qty
15260-303	OPTICAL GLASS CELL, 33mm (ASTM D1500)	1
15260-304	OPTICAL GLASS CELL, 50mm (ASTM D156)	1
15260-301	LAMP, 5V, 10W, lens ended	1

2 Years/2000 Tests - High Precision		Qty
15320-001	OPTICAL GLASS CELL, 100mm (Pt-Co/Hazen/APHA/Saybolt)	1
15260-303	OPTICAL GLASS CELL, 33mm (ASTM D1500)	1
15320-003	OPTICAL GLASS CELL, 6 inch (IP Units)	1
15320-004	OPTICAL GLASS CELL, 10mm (Gardner)	1
15260-301	LAMP, 5V, 10W, lens ended	1

CHROMOMETERS

15311-2 SAYBOLT UNIVERSAL CHROMOMETER

ASTM D156; DIN 51 411; FTM 791 101; NF M07-003

- Two section field of view
- Three position filter turret

A colorimeter with an integral light source, for visual determination of the colour of highly refined, un-dyed liquid petroleum products, including gasolines, jet fuels, napthas and kerosines.

Comprises of a graduated glass sample column with a clear glass base, and a plain glass tube with a three position turret containing colour filter discs. An eyepiece provides a split-field view of both the column and tube. Illumination is from a light source in the base of the unit. The height of a column of sample is adjusted until it matches the colour disc in the reference tube. The height is then read off the graduations and expressed in Saybolt units.

SUPPLIED WITH: 3 whole-colour filter discs and 1 half-colour filter disc, daylight filter, mains lead and instruction manual.

15311-2

SPECIFICATIONS

Voltage:	220/240V, 50/60Hz	**Size (HxWxD):**	74 x 19 x 17cm
Power:	60W	**Weight:**	4.8kg
Fuses:	2 x 0.5A		

ACCESSORIES - Saybolt Universal Chromometer

CALIBRATION, VERIFICATION & TRAINING

SETA CERTIFIED COLOUR STANDARDS, *(for details see page 114).*

CONSUMABLES - Saybolt Universal Chromometer

2 Years/2000 Tests		Qty
15311-202	'O' RING, Viton, pack of 5	1
15311-204	BULB, 60W, pack of 2	1
15311-206	GASKET, for tube, pack of 12	1

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COMPARATORS

15250-4 SETA-LOVIBOND COLOUR COMPARATOR

ASTM D1500; IP 196; BS 2049; BS 5859; ISO 2049; FTM 791 102; NF T60-104; JIS K2580

- High discrimination 2 disc system
- Three section field of view
- Consistent illumination

For visual determination of the colour of oils and petroleum waxes. Readings calibrated in accordance with ASTM D1500.

The three section field-of-view optical system allows a sample and two reference standard colour filters to be viewed simultaneously, allowing easy comparison of colour. The colour filters are mounted in two discs, one with full value standards and the other with intermediate value standards, giving improved discrimination over single disc comparators. The discs and sample are illuminated by a tungsten quartz halogen light source colour corrected to CIE standard illuminant C. Replacement white inserts are available to ensure correct lighting levels are preserved.

SUPPLIED WITH: two filter discs, three sample containers, power supply unit and instruction manual.

15250-4

CONFORMANCE CERTIFICATE (WORKS)

SETAPLUS EXTENDED WARRANTY AVAILABLE

SPECIFICATIONS

Mode:	Transmittance
Filter Disc:	Disc 1 - ASTM No. 0.5, 1.5, 2.5, 3.5, 4.5, 5.5, 6.5, 7,5 Disc 2 -ASTM No. 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0
Path length:	33mm
Illuminant:	C
Voltage:	12V ac PSU, 110/120V or 220/240V, 50/60Hz, switchable
Size (HxWxD):	15 x 23 x 27cm
Weight:	1.5kg

ACCESSORIES - Seta-Lovibond Colour Comparator

OPTIONAL

45000-0	SETAPLUS EXTENDED 12 MONTH WARRANTY

CALIBRATION, VERIFICATION & TRAINING

SETA CERTIFIED COLOUR STANDARDS, *(see below for details).*

CONSUMABLES - Seta-Lovibond Colour Comparator

2 Years/2000 Tests		Qty
15250-202	SAMPLE CONTAINER, pack of 5	6
15250-301	HALOGEN LAMP, 20W	1
15250-401	WHITE INSERT REPLACEMENTS, pack of 3	1

COLOUR REFERENCE STANDARDS

- High stability
- Certified to UKAS/ISO
- 500ml bottle

Suitable for routine calibration of instruments, and verification of test results. The highly colour stable standards are also suitable for instrument and laboratory correlation. Each colour reference standard is packaged in a 500ml bottle, and has a shelf life of 12 months (6 months for Pt-Co standards).

CONFORMANCE CERTIFICATE (ISO 9001) OR
CALIBRATION CERTIFICATE (UKAS) - SEE TABLE

PLATINUM-COBALT COLOUR REFERENCE STANDARDS

ASTM D1209		
Seta Part Number	**Certified Value (nom)**	**Certification**
15380-0	5	ISO 9001
15381-0	10	ISO 9001
15382-0	15	ISO 9001
15383-0	30	ISO 9001
15384-0	50	ISO 9001
15385-0	100	ISO 9001

GARDNER COLOUR REFERENCE STANDARDS

ASTM D1544; D6166		
Seta Part Number	**Certified Value (nom)**	**Certification**
15374-0	2	UKAS to ISO 17025
15375-0	5	UKAS to ISO 17025
15376-0	8	UKAS to ISO 17025

ASTM COLOUR REFERENCE STANDARDS

ASTM D1500; D6045		
Seta Part Number	**Certified Value (nom)**	**Certification**
15370-0	<0.5	UKAS to ISO 17025
15371-0	1	UKAS to ISO 17025
15372-0	3	UKAS to ISO 17025
15373-0	5	UKAS to ISO 17025

SAYBOLT COLOUR REFERENCE STANDARDS

ASTM D156; D6045 (Range of 0 to 30 only)		
Seta Part Number	**Certified Value (nom)**	**Certification**
15386-0	-10	UKAS to ISO 17025
15387-0	0	UKAS to ISO 17025
15388-0	12	UKAS to ISO 17025
15389-0	25	UKAS to ISO 17025

COLOUR CONFORMANCE FILTERS

For quick and simple conformance checks on Seta-Lovibond High Precision Colorimeters. Each filter set comprises coloured glasses representing a spread of colours from the scale and a storage case.

CONFORMANCE CERTIFICATE (ISO 9001) OR
CALIBRATION CERTIFICATE (UKAS) - SEE TABLE

COLOUR CONFORMANCE FILTERS

Seta Part Number	Colour	No Of Filters	Certification
15301-0	ASTM Colour	3	0.5, 3.5, 5.0
15302-0 (only suitable for 15320-2 Seta-Lovibond Colour Colorimeter)	Saybolt Colour	5	-8.0, 0, 10, 18, 25

CONDUCTIVITY METER

99708-0 HAND HELD CONDUCTIVITY METER

99708-0

ASTM D2624; IP 274

- Higher Accuracy AC Measurement
- Conductivity and temperature output capability
- High-Accuracy (± 2% of reading)
- Stores up to 10 Data Locations (User can input Location Names)
- USB interface for ease of data transfer to user
- Fully Temperature Compensated Measurement
- Built-in Long Life Lithium-Ion Rechargeable Battery
- Windows Data Handling Software
- Internal Real Time Date & Clock for Data Record Keeping

The unit is provided in an industry standard polyamide housing, with built in Lithium Ion rechargeable battery system. The conductivity sensor is constructed of two 316SS coaxial electrode sensors. It has an easy to use menu system allowing up to 10 samples to be internally stored along with Sample Temperature, Date and Time.

SPECIFICATIONS	
Conductivity Range:	0-2000 pS/m (optional ranges available – contact factory)
Conductivity Accuracy:	± 2 pS/m (± 2% of reading)
Conductivity Resolution:	0.1 pS/m
Temperature Range:	0-35°C (optional ranges available – contact factory)
Temperature Accuracy:	± 0.5°C
Temperature Resolution:	0.1°C
Power:	Built-in 2.6AHr Lithium Ion Battery (1000 samples)
Outputs:	128x64 Dot Matrix Display Indicating Conductivity and Temperature Sample Trend Line Graph to Assist Data Collection
Conductivity Sensor:	316 SS Coaxial Electrode
Temperature Sensor:	Platinum RTD NIST Traceable Calibration
Materials:	Housing Polyamide Sensor 316SS and PEEK
Size (HxWxD):	31 x 11 x 10cm
Weight:	0.5kg

ACCESSORIES – Conductivity Meter

OPTIONAL

99708-002	BENCH STAND
99708-005	CARRY CASE

AUTOMATIC TESTERS

99600-2 AUTOMATIC OIL TESTER, 60KV

99610-2 AUTOMATIC OIL TESTER, 80KV

99620-2 AUTOMATIC OIL TESTER, 100KV

ASTM D877; D1816; D3300; IP 295; AS 1767; BS 148; BS 5874; CEI 344; FTM 791 5702; IEC 156; NFC 27; NF C27-221; rOCT5861; SABS 555; VDE 0370

99600-2

- Automatic test sequence
- Pre-set and user defined programs
- 60kV, 80kV, or 100kV models
- Integral printer
- RS232 interface
- Fully interlocked
- Multi language

These oil test sets use either pre-programmed or user defined parameters entered via the menu driven multi-language display. Results are printed out on an integral printer. Features include a self-check facility, RS232C interface, and safety interlock.

SUPPLIED WITH: 36mm diameter mushroom, 13mm diameter spherical and 1 inch diameter cylindrical electrodes, spacing gauge, spare magnetic stirrer bars, 400ml oil test vessel, and instruction manual.

SPECIFICATIONS			
Seta Part	99600-2	99610-2	99620-2
Test Voltage:	60kV	80kV	100kV
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz		
Power:	750W		
Size (HxWxD):	47 x 50 x 32cm		
Weight:	41kg		

ACCESSORIES – Automatic Oil Testers

OPTIONAL

99605-0	OIL TEST VESSEL, with motorized stirrer, 800ml capacity, for ASTM D1816 only.
99620-201	OIL TEST VESSEL, 13mm dia. spherical electrodes.
99620-202	OIL TEST VESSEL, 36mm dia. mushroom electrodes.
99620-203	OIL TEST VESSEL, 1 inch dia. cylindrical electrodes.
99606-0	TRANSPORTATION TROLLEY

CALIBRATION, VERIFICATION & TRAINING

99625-0	VOLTAGE CALIBRATION METER

CALIBRATION & VERIFICATION MATERIALS

99625-0 VOLTAGE CALIBRATION METER

99625-0

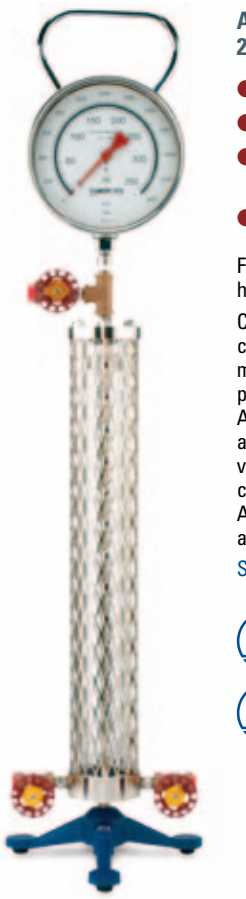
- 100kV maximum voltage
- Automatic operation

An automatic meter to test and calibrate up to 100kV on Automatic and Portable Oil Test Sets to an accuracy of 3% f.s.d. over a temperature range 0° to 40°C.

SPECIFICATIONS	
Size (HxWxD):	20 x 24 x 10cm
Weight:	2.4kg

SPECIFIC GRAVITY

22100-0 SETA PRESSURE HYDROMETER APPARATUS



22100-0
(Pressure Gauge
supplied separately)

ASTM D1657 (obs); IP 59 Method C (obs); IP 235; ISO 3993; NF M41-008 (obs); JIS K2249

- 1400kPa (200 psi) max working pressure
- Operating temperature range -20 to 45°C
- Transparent cylinder pressure tested to 2800kPa (400psi)
- Steel safety mesh

For determining the density or specific gravity of light hydrocarbons including LP gases.

Comprises a polymethylmethacrylate pressure cylinder surrounded by a stainless steel mesh for maximum safety. A vapour vent-valve with tee-piece for a pressure gauge is mounted on the top. A buffer pad is incorporated for the hydrometer and a mounting clip for a thermometer. Inlet and outlet valves are mounted in the base and the instrument is connected to the LPG line via 1/4 BSP connections. A range of hydrometers and thermometers are available as accessories.

SUPPLIED WITH: instruction sheet.

PRESSURE CERTIFICATE (WORKS)

SETAPLUS EXTENDED WARRANTY AVAILABLE

22101-4 with 22100-0
(supplied separately)

ACCESSORIES - Pressure Hydrometer App.

REQUIRED

Refer to the table of "ITEMS REQUIRED FOR EACH TEST" and select from the following options:

22580-2 SETA PRESSURE GAUGE, 0 to 2000 kPa (0 to 290 psi).

22680-0 HYDROMETER, 0.500 to 0.580 g/cm3 (for ISO and IP Methods).

22690-0 HYDROMETER, 0.570 to 0.650 g/cm3 (for ISO and IP Methods).

22730-0 THERMOMETER, ISO/R653, -15° to +45°C (for ISO 3993).

22720-0 THERMOMETER, BS 593 B60 C/Total, -20 to +60°C (for IP235).

22705-0 THERMO-HYDROMETER, ASTM310H, 0.500 - 0.650 specific gravity, thermometer -1.1°C to 32°C (for ASTM D1657).

22710-0 THERMO-HYDROMETER, ASTM101H, 0.500 - 0.650 specific gravity, thermometer 30°F to 90°F (for ASTM D1657).

CERTIFICATION: UKAS CERTIFICATION OF PRESSURE GAUGES AND HYDROMETERS OPTIONAL

22101-4 HYDROMETER BATH AND COOLER, accepts 22100-0 pressure hydrometer apparatus as shown.

Temperature Range:	0 to 100°C
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Power:	1.4kW
Size (HxWxD):	62 x 35 x 33cm
Weight:	30kg (Bath) 28kg (Cooler)

OPTIONAL

45000-0 SETAPLUS EXTENDED 12 MONTH WARRANTY

ITEMS REQUIRED FOR EACH TEST

Seta No	D1657 (obs)	IP 59 (obs)	IP 235	ISO 3993
22580-2	●	●	●	●
22680-0		●	●	●
22690-0		●	●	●
22730-0				●
22720-0			●	
22705-0	●			
22710-0	●			

SPECIFICATIONS

Max Working Pressure:	1400kPa (200psi)
Temperature Range:	-20 to 60°C
Size (HxWxD):	62 x 20 x 20cm
Weight:	4.2kg

CONSUMABLES - Pressure Hydrometer App.

2 Years/2000 Tests	Qty
22100-002 GASKET, pack of 10	1

RELATIVE DENSITY

97300-0 SCHILLING EFFUSIOMETER

IP 59 Method C (obs)

An instrument providing a rapid and convenient method for determining the density of a gas relative to air.

Based on the assumption that the times taken by equal volumes of gases, under the same temperature and pressure, to flow through a small orifice are proportional to the square roots of the densities of the gases.

SUPPLIED WITH: instruction manual.

97300-0

97320-0

97310-0

SPECIFICATIONS

Size (HxWxD):	62 x 30 x 30cm
Weight:	4kg

ACCESSORIES - Schilling Effusiometer

OPTIONAL

97310-0 SETA TRANSIT CASE, lightweight with foam inserts, to receive Effusiometer, thermometer and spares.

97320-0 SETA METAL STAND, with carrying handle, to support Effusiometer when in use.

THERMOMETERS:

IP39F or IP39C

CONSUMABLES - Schilling Effusiometer

2 Years/2000 Tests	Qty
97300-004 RUBBER RING, pack of 5.	1
97300-005 GLASSWARE SEAL RING, pack of 5	1

WATER VAPOUR

97500-0 FREEZE VALVE

97500-0

ASTM D2713; IP 395; ISO 13758

- Moisture test for propane type LPG
- Standard gas bottle connection
- Particle filter

A go/no-go tester for water vapour content in propane type LPG. The time taken for an orifice to block with ice when LPG flows through it at normal vapour pressure gives an indication of the tendency for malfunction in pressure reduction systems.

The valve has two operating positions, full flow for chilling/purging and restricted flow for testing and is fitted with a particle filter. Suitable for standard gas bottle connection.

SUPPLIED WITH: carry case and instruction manual.

SPECIFICATIONS	
Size (HxWxD):	20 x 4 x 4cm
Weight:	1kg

ACCESSORIES - Freeze Valve

REQUIRED

22750-2 DIGITAL STOPWATCH, *(for details see page 141).*

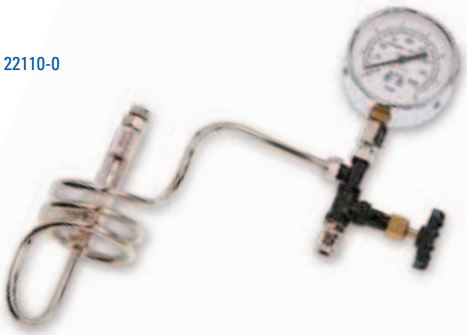
CONSUMABLES - Freeze Valve

2 Years / 2000 Tests — Qty

97500-002 FILTER ELEMENT & GASKET 1
97500-003 BODY GASKET, pack of 5. 1
97500-005 RETAINING RING, pack of 10 1

22110-0 DRYNESS TESTER

22110-0



GPA 2140

The 22110-0 Dryness Tester gives an indication of the dryness of Commercial Propane and Propane HD5 by colorimetric indication.

The tester comprises inlet valve, cooling coil, capillary orifice, glass tube, metal shield, protective caps and pressure gauge, 0 to 4 bar (0 to 60 psi).

In operation, a cotton wool plug impregnated with Cobalt Bromide is exposed to the vapour under pressure. A colour change indicates "Wet" or "Dry" in accordance with GPA 2140.

SUPPLIED WITH: instruction manual.

SPECIFICATIONS	
Size (HxWxD):	15 x 32 x 10cm
Weight:	3kg

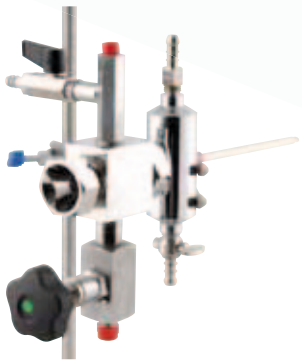
ACCESSORIES - Dryness Tester

REQUIRED

16990-005 SETA ICE BATH, comprises an unsilvered dewar flask mounted in a wooden case with viewing windows.

Note: Other items which may be required include Cobalt Bromide plugs.

22120-3 DEW-POINT APPARATUS



22120-3 (Thermometer supplied separately)

ASTM D1142

- Bureau Of Mines type
- Accuracy ±0.1°C

To determine the water vapour content by measuring the dew point. The sample enters a stainless steel chamber and passes across a mirror cooled by a refrigerant. The temperature at which water vapour starts to condense on the mirror is indicated by a thermometer, viewed through a pressure-resisting window.

SUPPLIED WITH: instruction manual.

SPECIFICATIONS	
Size (HxWxD):	20 x 20 x 10cm
Weight:	5kg

ACCESSORIES - Dew Point Apparatus

REQUIRED

SETA PRESSURE GAUGES

15600-0 0 to 13.8 bar (0 to 200 psi).
16440-0 0 to 8.3 bar (0 to 120 psi).
22121-0 0 to 4 bar (0 to 60 psi).
22122-0 0 to 40 bar (0 to 600 psi).
22123-0 0 to 70 bar (0 to 1 000 psi).
22124-0 0 to 140 bar (0 to 2 000 psi).

THERMOMETERS

22125-0 0° to +100°F.
22126-0 -40° to +250°F.
22127-0 -40° to +460°F.

OPTIONAL

22128-0 TRIPOD, with adjustable legs, for field use.

22130-2 SETA PRE-COOLING APPARATUS

22130-2

ASTM D1837; D2158; IP 317; NF M41-012

Comprises a soft copper cooling coil in a wide-mouth dewar flask, supported in an insulated metal case. An outlet valve controls the flow of liquid.

SPECIFICATIONS	
Size (HxWxD):	50 x 20 x 20cm
Weight:	3kg

ACCESSORIES - Pre-Cooling Apparatus

REQUIRED

22160-0 RECEIVER, 100ml, borosilicate glass, for use with the mercury freeze method, pack of 3.
22170-0 WEATHERING TUBE, 100ml, graduated centrifuge tube, borosilicate glass, pack of 3.
22180-0 SETA WATER BATH, brass, for (ASTM D1837).

THERMOMETERS:

ASTM99F and 87500-0 Brass Thermometer Case (for ASTM D1837).
ASTM5F/IP1F or ASTM57F (for ASTM D2158).
ASTM5F/IP1F or ASTM5C/IP1C (for IP 317).

18

CORROSION TESTS

22150-5 SETA LPG CORROSION PRESSURE VESSEL

ASTM D1838; IP 411; ISO 6251; EN 26251 (obs); BS 2000 Part 411; BS 6924; NF M41-007

- Seamless stainless steel body
- Pressure tested to 70bar (1015psi)

Used to determine the resistance to corrosion of a polished copper strip when immersed in an LPG sample.

Comprises a seamless polished stainless steel vessel with two stainless steel needle valves with viton seals, dip tube and 'O' ring sealed cap. 35bar (507psi) safe working pressure.

22150-5

ACCESSORIES – LPG Corrosion Pressure Vessel

REQUIRED

11241-0	SILICONE CARBIDE PAPER, 105µm (150 grit), 28 x 23cm, pack of 50.
11460-0	SILICONE CARBIDE CLOTH, 65µm (240 grit), 28 x 23cm, pack of 50.
11470-0	SILICONE CARBIDE PAPER, 100 grit, 28 x 23cm, pack of 50.
11480-0	SILICONE CARBIDE GRAINS, 105µm (150 mesh), pack of 5 x 300g.
11530-0	SETA MULTI-STRIP VICE, to hold copper strips while being polished.
11570-0	FLAT GLASS TEST TUBE, to protect strip during inspection, pack of 10.
11580-0	ASTM-IP COPPER STRIP CORROSION STANDARD, a set of thirteen plaques, printed on aluminium and encased in plastic for protection.
22190-0	COPPER TEST STRIP, 75 x 12.5 x 2.4mm with 3.0mm hole, pack of 30, supplied with material certificate.
22220-4	CORROSION BATH, see separate entry for details.
22230-0	SETA BRACKET, holds Pressure Vessel correctly in bath, pack of 3.

THERMOMETERS:

ASTM12C/IP64C; ASTM12F/IP64F

PRESSURE CERTIFICATE (WORKS)

22220-4 CORROSION TEST BATH

ASTM D1838; IP 411; ISO 6251; EN 26251 (obs); BS 2000 Part 411; BS 6924; NF M41-007

- Temperature range ambient +5 to 100°C
- 3 test stations
- Integral stirrer

A stainless steel water bath that can accommodate up to three pressure vessels.

The bath is fitted with a combined heater and circulator with thermostatic temperature control and digital display. A gabled stainless steel lid is supplied with the bath.

SUPPLIED WITH: mains lead and instruction manual.

SPECIFICATIONS	
Temperature Range:	Ambient +5 to 100°C
Stability:	± 0.2°C
Capacity:	38 litres
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Power:	1.4kW
Size (HxWxD)::	60 x 35 x 33cm
Weight:	9kg

22220-4 (with 22150-5 installed)

22090-0 SETA COOLING UNIT

- Permits LPG samples to be taken from pipelines or tanks
- Maintains the gas in liquid phase

The unit comprises a nickel-plated brass container fitted with an inlet cooling coil, sampling outlet tube and pressure control valves.

In operation the cooling unit is filled with solid carbon dioxide and the inlet is connected to the sampling point. The sample is drawn into the cooling unit and is isolated by closing the valves. Liquefied gas is then drawn from the bottom of the cooling unit via the outlet tube which may be connected to a pressure sampling or vapour pressure cylinder.

SPECIFICATIONS	
Size (HxWxD):	33 x 85 x 26cm
Weight:	2.9kg

22090-0

SAMPLING CYLINDERS

ASTM D1265; IP 51 (obs); IP 104 (obs); IP 181 (obs); ISO 4257; BS 2000 Part 104 (obs); BS 5309 Parts 2 & 3; NF M41-001

- 46bar (670psi) maximum working pressure
- Single and double valve models
- 1/8in. BSP connections
- Outage tube on double valve versions
- 1316 Stainless steel body and valve

A range of heavy duty stainless steel single and double valve sampling cylinders suitable for drawing LPG samples from pressurised storage and transferring them to laboratory equipment. The outage tube end is marked on double valve cylinders.

SINGLE VALVE SAMPLING CYLINDERS

SETA Part	Total Capacity	Outage Tube	Height (inc Valves)	Diameter	Maximum SWP
20510-4	50ml	No	21.2cm	3.8cm	46bar (670psi)
20470-5	100ml	No	25.2cm	2.8cm	46bar (670psi)

PRESSURE CERTIFICATE (WORKS)

DOUBLE VALVE SAMPLING CYLINDERS

SETA Part	Total Capacity	Outage Tube	Height (inc Valves)	Diameter	Maximum SWP
21520-4	50ml	20%	32.5cm	3.8cm	46bar (670psi)
21530-4	100ml	20%	40.5cm	3.8cm	46bar (670psi)
21540-4	200ml	20%	38.6cm	5.7cm	46bar (670psi)
21550-4	250ml	20%	41.7cm	5.7cm	46bar (670psi)
21560-5	500ml	20%	41.5cm	7.6cm	46bar (670psi)
21600-4	1000ml	20%	57.4cm	7.6cm	46bar (670psi)
21620-4	2000ml	20%	66.3cm	9.85cm	46bar (670psi)
21690-4	4000ml	20%	105.5cm	9.85cm	46bar (670psi)

Note: 21620-4 and 21690-4 not for sale in the EU.

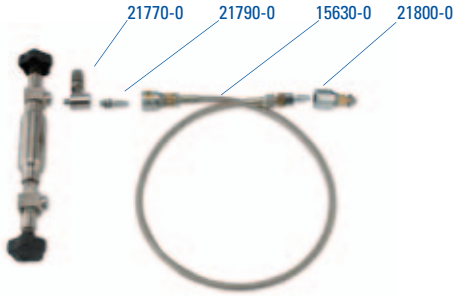
PRESSURE CERTIFICATE (WORKS)

20470-5 and 21560-5 Sampling Cylinders

ACCESSORIES – Sampling Cylinders

OPTIONAL

15630-0	SETA CHARGING LEAD - HIGH PRESSURE, length 1 metre for pressures up to 46bar (670psi). With braided stainless steel outer cover. Fitted with Hansen high pressure quick connect couplings, male one end, female the other.
21770-0	SETA RELIEF VALVE - HIGH PRESSURE, for maximum safety, mounted between sample source and the charging lead, or the charging lead and sampling cylinder. One end fitted with 1/8in BSP female, the other 1/8in BSP male. Set to relieve at 46bar (670psi).
21790-0	SETA QUICK CONNECTION COUPLING - HIGH PRESSURE, male Hansen to 1/8in BSP male. For pressures up to 46bar (670psi).
21800-0	SETA QUICK CONNECTION COUPLING - HIGH PRESSURE, female Hansen to 1/8in BSP male. For pressures up to 46bar (670psi).
21830-0	SETA ADAPTOR, 1/8in BSP male to 1/8in BSP male. Suitable to convert sampling cylinder valve from female to male. Pack of 2.
21832-0	SETA ADAPTOR, 1/4in BSP male to 1/8in BSP female. Suitable for use with 22100-0 Pressure Hydrometer Apparatus. Pack of 2.
21835-0	SETA ADAPTOR, 1/4in BSP female to 1/8in BSP female. Suitable for use with 22150-3 LPG Corrosion Test Vessel. Pack of 2.
21840-0	SETA CONNECTOR PIPE, copper, 1/4in diameter x 20SWG. One metre long, plain one end to 1/8in BSP male.
21850-0	SETA CONNECTOR PIPE, copper, 1/4in diameter x 20SWG. One metre long, plain one end to 1/8in NPTF male.
21501-3	SETA PROTECTION COLLAR, prevents damage to valves, stops rolling, use as carry handle. To fit 21560-3 and 21600-3 Sampling Cylinders.
21502-2	SETA PROTECTION COLLAR, prevents damage to valves, stops rolling, use as carry handle. To fit 21540-3 and 21550-3 Sampling Cylinders.



A double valve cylinder with high pressure charging components

A double valve cylinder fitted with 21502-2 collars

18

LIQUID SAMPLERS

A range of vessels and accessories for collecting liquid samples from bulk storage and transport tanks. Universal samplers can collect samples at a chosen distance from the base of the tank when the valve actuator contacts the bottom of the tank and operates the bottom valve. Alternatively, sample can be taken from any intermediate level via a snatch cord operated top valve. Multi-level samplers are only equipped with a snatch cord operated top valve and are used to collect samples from intermediate levels.

Note: Multi-level Samplers are not suitable for bottom sampling.

UNIVERSAL SAMPLERS

- Bottom or Multi-Level sampling
- Automatic opening and closing bottom valve
- 1 to 35 cm adjustable tank bottom sensor
- Snatch cord opening top valve
- Top valve latches open
- "Top Hat" prevents sample contamination

ACCESSORIES - Universal Samplers

OPTIONAL

14866-2 WINDER, *(for details see page 121).*

A valve at the bottom of the universal sampler is actuated by an adjustable bottom sensor, allowing true bottom sampling between 1 and 35 cm above the bottom of the bulk container. The valve at the top of the sampler is actuated by a snatch cord and latches in the open position. A "Top Hat" prevents the liquid running down the line from contaminating the contents of the sampler.

14875-0

Top Valve

Bottom Valve

UNIVERSAL SAMPLERS

Seta Part	Capacity	Sampling Range (height from bottom)	Diameter	Length (probe retracted)	Weight	Material
14875-0	500ml	1 to 20cm	6.4cm	34.5cm	2kg	Stainless steel
14876-0	500ml	1 to 20cm	6.4cm	34.5cm	2kg	Brass
14877-0	1 litre	1 to 35cm	6.4cm	52cm	2.5kg	Stainless steel

MULTI-LEVEL SAMPLERS

- Snatch cord opening
- Valve latches open
- "Top Hat" prevents sample contamination

ACCESSORIES - Multi-Level Samplers

OPTIONAL

14866-2 WINDER, *(for details see page 121).*

14851-0 14854-0 14858-0 14859-0

MULTI-LEVEL SAMPLERS

Seta Part	Capacity	Valve Throat Diameter	Diameter	Length	Weight	Material
14851-0	450ml	2.1cm	3.8cm	55cm	1.1kg	Brass
14852-0	450ml	2.1cm	3.8cm	55cm	1.1kg	Stainless steel
14854-0	500ml	2.3cm	5.0cm	43cm	1.5kg	Stainless steel
14857-0	1 litre	3.1cm	6.4cm	48cm	2.2kg	Brass
14858-0	1 litre	3.1cm	6.4cm	48cm	2.2kg	Stainless steel
14859-0	2.5litre	4.0cm	10.2cm	50cm	4kg	Stainless steel

MULTI-LEVEL SELF-SEALING SAMPLERS

- Detachable container
- Snatch cord opening
- Reseals when container is full

ACCESSORIES - Self-Sealing Samplers

OPTIONAL

14866-2 WINDER, *(for details see page 121).*

14842-0

MULTI-LEVEL SELF-SEALING SAMPLERS

Seta Part	Capacity	Valve Throat Diameter	Diameter	Length	Weight	Sample Vessel	Cage Material
14840-0	500ml	2.3cm	10.2cm	39cm	1.7kg	Bottle & Lid	Brass
14841-0	500ml	2.3cm	10.2cm	39cm	1.7kg	Bottle & Lid	Stainless steel
14842-0	1 litre	2.1cm	14cm	42cm	2.2kg	Winchester	Brass
14843-0	1 litre	2.1cm	14cm	42cm	2.2kg	Winchester	Stainless steel
14844-0	1 litre	2.1cm	7.7cm	38cm	2.2kg	Can	Stainless steel

WINDER

14866-2 WINDER

- 30 metre wire cable
- Ferrule at 1, 5 and 10m intervals
- Tested at 20kg load
- Anti spark design

SPECIFICATIONS	
Size (LxWxDia):	28 x 14 x 20cm dia. reel
Weight:	3kg

14866-2

A winder suitable for use with Seta Liquid Samplers, for safe and clean sampling.

The geared drum carries 30 metres of 2mm dia. dip wire, and is fitted with a braking/locking device. The dip wire terminates in a latching hook for secure attachment to a sampler. A small ferrule is attached to the dip wire at 1 metre intervals, with a large ferrule every 5 metres and two large ferrules every 10 metres. A grounding cable and clip provide electrical continuity between the sampler and electrical earth. The winder is equipped with a support strut and carrying handle.

SAMPLING CANS

ASTM D4057; D4306; IP 51 (obs), BS 3195 Part 1; DIN 51 750; ISO 3170; API 2546; NF M07-001; API MPMS Chapter 8

- Cork stopper fitted with metal washers and hook
- Weight enclosed in false bottom
- Heavy gauge wire handle with cable guide
- Perforated thermometer well on double wall model

14700-0 14720-0 14801-0 14740-0

A series of simple and safe to use vessels to take samples from non-pressurised bulk storage without contamination and transferring them to laboratory equipment.

The sample cans and fittings are manufactured from either copper, tinned steel, or (for Jet Fuel use) stainless steel. A double wall sample can with a copper inner and a brass outer, equipped with a perforated thermometer well, is available for heated oil samples.

SINGLE WALL SAMPLING CANS

Seta Part	Capacity	Material	Diameter	Length (inc.handle)	Neck Dia. (internal)	Weight
14710-0	500ml	Copper	6.4cm	31cm	3.8cm	1.25kg
14730-0	500ml	Tinned Steel	6.4cm	32cm	3.8cm	1.4kg
14800-0	500ml	Stainless Steel	6.4cm	31cm	3.8cm	1kg
14790-0	1 litre	Copper	8.3cm	34cm	3.8cm	2kg
14700-0	1 litre	Copper	8.3cm	35cm	3.8cm	2.5kg
14720-0	1 litre	Tinned Steel	8.3cm	36cm	3.8cm	2.4kg
14801-0	1 litre	Stainless Steel	8.3cm	36cm	3.8cm	2kg
14750-0	1.5 litre	Copper	8.3cm	45cm	3.8cm	3kg
14802-0	2 litre	Stainless Steel	8.3cm	63cm	3.8cm	2.5kg

DOUBLE WALL SAMPLING CANS

Seta Part	Capacity	Material	Diameter	Length (inc.handle)	Neck Dia. (internal)	Weight
14740-0	1 litre	Copper Inner Brass Outer	8.8cm	43cm	2.5cm	2.7kg

ACCESSORIES - Sampling Cans

OPTIONAL

THERMOMETERS (*14740-0 only).*
IP 48C; IP 49C; IP50C; 1P51C.

BACON SAMPLING VESSELS

- Bottom opening valve
- Snatch cord or self actuated
- Valve stem locking device

21711-0

A sampler with a bottom opening valve used for non-pressurised sampling. The valve can be actuated at any depth by a snatch cord, or self-actuated when either the valve or its extender rod strikes the bottom of the storage tank.

'BACON' SAMPLING VESSELS

Seta Part	Capacity	Diameter	Length	Weight	Material
21711-0	950ml	8.0cm	38cm	3.2kg	Nickel-plated brass
21712-0	475ml	6.5cm	30cm	2.0kg	Nickel-plated brass

ACCESSORIES - 'BACON' Sampling Vessels

OPTIONAL

21715-0	EXTENDER ROD, 7.5cm long.
21716-0	EXTENDER ROD, 15cm long.
21717-0	EXTENDER ROD, 30cm long.
21718-0	EXTENDER ROD, 45cm long.

SAMPLING CAGE

14760-2 SETA SAMPLING CAGE

- Fitted with cork, brass discs and hook
- Threaded neck for 14770-0 sample bottle

SPECIFICATIONS	
Cage Height:	25cm
Cage Diameter:	10cm

ACCESSORIES - Sampling Cage

REQUIRED

14770-0	SAMPLING BOTTLE, 500ml capacity, amber glass, screw lid, 15cm high, 8cm dia, screws into 14760-2 Sampling Cage, pack of 28.

14760-2 with 14770-0 fitted

DIP TUBES

14810-0 SETA SAMPLING TUBE

- 600ml capacity
- 0.9 metres long
- Perspex

A quick and easy method of drawing samples from drums, barrels, cans or tank wagons to within 3mm of the bottom of the vessel.

Comprises a 600ml capacity tube manufactured from tough transparent perspex and capped at either end by bonded-in perspex plugs. 6mm diameter holes allow sampling and venting and the bottom plug has a conical internal profile to allow sediment to collect when the tube is held vertically.

DIP TAPES AND WEIGHTS

14940-0 DIP TAPE AND FRAME

ASTM D1085; FTM 791 8003

- 30 metre steel tape
- Graduated in m/cm/mm (IP M8)
- Brass winding frame

SPECIFICATIONS	
Tape Length:	30m
Size (LxWxDia):	28 x 4 x 120cm dia. reel
Weight:	1.2kg

A 30 metre reel of 13 mm wide hardened and tempered carbon steel tape, graduated in metres, centimetres and millimetres, mounted in a brass frame with a carrying handle and a folding winding handle.

Note: Requires a dip weight.

14940-0 and 14460-0

TORPEDO-SHAPED DIP WEIGHTS

- Graduated in cm/mm (IP M10)
- 15 cm length
- Brass

TORPEDO-SHAPED DIP WEIGHTS		
Seta Part	Weight	Application
14420-0	0.7kg	Light oils
14460-0	1.5kg	Heavy oils

WATER/ULLAGE RULES

14620-0 WATER FINDING RULE

14620-0

Detects water under black oils (crude) and heavy fuels. Used with marker pastes and dip tape to monitor depths. Typical immersion times 20 to 60 seconds according to the product being tested.

Brass and acrylic construction, graduated from 0 to 350mm and grooved on one side to accept a thin layer of water or gasoline finding paste. Conforms with IP M14 (Metric).

CALIBRATION CERTIFICATE (WORKS)

WATER/ULLAGE FINDING MATERIALS

Supplied in 100g jar, pack of 10.

WATER/ULLAGE FINDING MATERIALS	
Seta Part	Description
14630-0	Water Finding Paste
14640-0	Gasoline Ullage Paste

TANK TEMPERATURE SAMPLING

87520-0 ASTM/IP TANK SAMPLING THERMOMETER CASE

87520-0 with Thermometer (not supplied)

- 100ml sample cup
- Non-sparking design

Non-sparking design complying with ASTM and IP recommendations. Fitted with a retaining handle at the top of the case for attaching a cord, a 100ml cup at the bottom for collecting the sample and two clips to retain the thermometer.

Suitable for ASTM58C, 58F, 59C, 59F, 60C, 60F and IP48C, 49C, 50C, 51C, 52C and 53C thermometers.

SPECIFICATIONS	
Size (HxWxD):	41 x 3 x 5cm
Weight:	0.25kg

SAMPLING CYLINDERS

ASTM D1265; IP 51 (obs); IP 104 (obs); IP 181 (obs); ISO 4257; BS 2000 Part 104 (obs); BS 5309 Parts 2 & 3; NF M41-001

- 46bar (670psi) maximum working pressure
- Single and double valve models
- 1/8in. BSP connections
- Outage tube on double valve versions
- 1316 Stainless steel body and valve

A range of heavy duty stainless steel single and double valve sampling cylinders suitable for drawing LPG samples from pressurised storage and transferring them to laboratory equipment. The outage tube end is marked on double valve cylinders.

20470-5 and 21650-5 Sampling Cylinders

SINGLE VALVE SAMPLING CYLINDERS

SETA Part	Total Capacity	Outage Tube	Height (inc Valves)	Diameter	Maximum SWP
20510-4	50ml	No	21.2cm	3.8cm	46bar (670psi)
20470-5	100ml	No	25.2cm	2.8cm	46bar (670psi)

PRESSURE CERTIFICATE (WORKS)

DOUBLE VALVE SAMPLING CYLINDERS

SETA Part	Total Capacity	Outage Tube	Height (inc Valves)	Diameter	Maximum SWP
21520-4	50ml	20%	32.5cm	3.8cm	46bar (670psi)
21530-4	100ml	20%	40.5cm	3.8cm	46bar (670psi)
21540-4	200ml	20%	38.6cm	5.7cm	46bar (670psi)
21550-4	250ml	20%	41.7cm	5.7cm	46bar (670psi)
21560-5	500ml	20%	41.5cm	7.6cm	46bar (670psi)
21600-4	1000ml	20%	57.4cm	7.6cm	46bar (670psi)
21620-4	2000ml	20%	66.3cm	9.85cm	46bar (670psi)
21690-4	4000ml	20%	105.5cm	9.85cm	46bar (670psi)

Note: 21620-4 and 21690-4 not for sale in the EU.

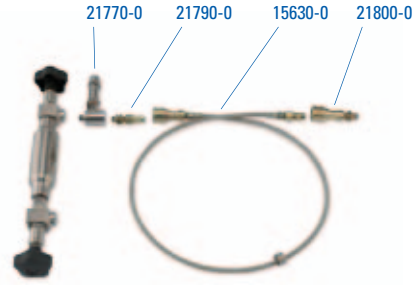
PRESSURE CERTIFICATE (WORKS)

A double valve cylinder fitted with 21502-2 collars

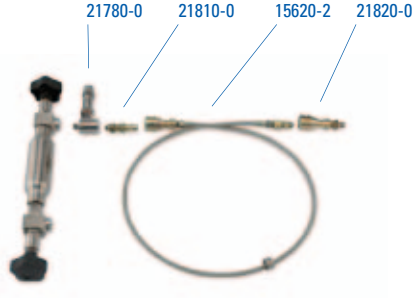
ACCESSORIES – Sampling Cylinders

OPTIONAL

15620-2	SETA CHARGING LEAD - LOW PRESSURE. Length one metre, for pressures up to 14 bar (200psi). Fitted with Schrader quick-connect couplings, male one end, female the other.
15630-0	SETA CHARGING LEAD - HIGH PRESSURE. Length one metre, for pressures up to 46 bar (670psi). Braided stainless steel outer cover. Fitted with Hansen high-pressure quick-connect couplings, male one end, female the other.
21770-0	SETA RELIEF VALVE - HIGH PRESSURE, for maximum safety, mounted between sample source and charging lead or charging lead and sampling cylinder. One end fitted with 1/8in. BSP female, the other 1/8in.BSP male. Set to relieve at 46 bar (670psi).
21780-0	SETA RELIEF VALVE - LOW PRESSURE, for maximum safety, mounted between sample source and charging lead or charging lead and sampling cylinder. One end fitted with 1/8in. BSP female, the other 1/8in. BSP male. Set to relieve at 14 bar (200psi).
21790-0	SETA QUICK CONNECTION COUPLING - HIGH PRESSURE, male Hansen to 1/8in. BSP male, for pressures up to 46 bar (670psi).
21800-0	SETA QUICK CONNECTION COUPLING - HIGH PRESSURE, female Hansen to 1/8in. BSP male, for pressures up to 46 bar (670psi).
21810-0	SETA QUICK CONNECTION COUPLING - LOW PRESSURE, male Schrader to 1/8in. BSP male, for pressures up to 14 bar (200psi).
21820-0	SETA QUICK CONNECTION COUPLING - LOW PRESSURE, female Schrader to 1/8in. BSP male, for pressures up to 14 bar (200psi).
21830-0	SETA ADAPTOR, 1/8in. BSP male, suitable to convert sampling cylinder valve from female to male,pack of 2.
21832-0	SETA ADAPTOR, 1/4in. BSP male to 1/8in. BSP female, suitable for use wih 22100-0 Pressure Hydrometer Apparatus, pack of 2.
21835-0	SETA ADAPTOR, 1/4in. BSP female to 1/8in. BSP female, suitable for use with 22150-3 LPG Corrosion Test Vessel, pack of 2.
21840-0	SETA CONNECTOR PIPE, copper, 1/4in. diameter x 20 SWG. One metre long, plain end of 1/8in. BSP male.
21850-0	SETA CONNECTOR PIPE, copper 1/4in. diameter x 20 SWG. One metre long, plain end to 1/8in. NPTF male.
21501-3	SETA PROTECTION COLLAR, prevents damage to valves, stops rolling, use as a carrying handle, to fit 21560-3 and 21600-3 Sampling Cylinders.
21502-2	SETA PROTECTION COLLAR, prevents damage to valves, stops rolling, use as a carrying handle, to fit 21540-3 and 21550-3 Sampling Cylinders.



A double valve cylinder with high pressure charging components



A double valve cylinder with low pressure charging components

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ASTM THERMOMETERS

All Seta ASTM - IP thermometers are manufactured in accordance with ASTM E-1 and E-77 requirements.

KEY:- A=Graduations (minimum) B=Immersion Depth in mm C=Approximate Total Length in mm

Where numbers appear in both ASTM and IP columns they are jointly agreed equivalents

ASTM THERMOMETERS (ASTM E1)

ASTM	(IP)	APPLICATION/TYPE	RANGE			A	B	C
1C		Partial immersion	-20°	to	+150°C	1°C	76	322
1F		Partial immersion	0°	to	302°F	2°F	76	322
2C	(62C)	Partial immersion	-5°	to	+300°C	1°C	76	390
2F	(62F)	Partial immersion	20°	to	580°F	2°F	76	390
3C	(73C)	Partial immersion	-5°	to	+400°C	1°C	76	415
3F	(73F)	Partial immersion	20°	to	760°F	2°F	76	415
5C	(1C)	Cloud and Pour	-38°	to	+50°C	1°C	108	230
5F	(1F)	Cloud and Pour	-36°	to	+120°F	2°F	108	230
6C	(2C)	Low Cloud and Pour	-80°	to	+20°C	1°C	76	230
6F	(2F)	Low Cloud and Pour	-112°	to	+70°F	2°F	76	230
7C	(5C)	Low Distillation	-2°	to	+300°C	1°C	total	385
7F		Low Distillation	30°	to	580°F	2°F	total	385
8C	(6C)	High Distillation	-2°	to	+400°C	1°C	total	385
8F		High Distillation	30°	to	760°F	2°F	total	385
9C	(15C)	Low Pensky-Martens	-5°	to	+110°C	0.5°C	57	290
9F	(15F)	Low Pensky-Martens	20°	to	230°F	1°F	57	290
10C	(16C)	High Pensky-Martens	90°	to	370°C	2°C	57	290
10F	(16F)	High Pensky-Martens	200°	to	700°F	5°F	57	290
11C	(28C)	Cleveland Open Flash	-6°	to	+400°C	2°C	25	310
11F	(28F)	Cleveland Open Flash	20°	to	760°F	5°F	25	310
12C	(64C)	Density-Wide Range	-20°	to	+102°C	0.2°C	total	420
12F	(64F)	Density-Wide Range	-5°	to	+215°F	0.5°F	total	420
13C	(47C)	Loss on Heat	115°	to	170°C	0.5°C	total	155
14C	(17C)	Wax Melting Point	38°	to	82°C	0.1°C	79	375
14F	(17F)	Wax Melting Point	100°	to	180°F	0.2°F	79	375
15C	(60C)	Low Softening Point	-2°	to	+80°C	0.2°C	total	395
15F		Low Softening Point	30°	to	180°F	0.5°F	total	395
16C	(61C)	High Softening Point	30°	to	200°C	0.5°C	total	395
16F		High Softening Point	85°	to	392°F	1°F	total	395
17C		Saybolt Viscosity	19°	to	27°C	0.1°C	total	275
17F		Saybolt Viscosity	66°	to	80°F	0.2°F	total	275
18C	(23C)	Reid Vapour Pressure	34°	to	42°C	0.1°C	total	275
18F	(23F)	Reid Vapour Pressure	94°	to	108°F	0.2°F	total	275
19C		Saybolt Viscosity	49°	to	57°C	0.1°C	total	275
19F		Saybolt Viscosity	120°	to	134°F	0.2°F	total	275
20C		Saybolt Viscosity	57°	to	65°C	0.1°C	total	275
20F		Saybolt Viscosity	134°	to	148°F	0.2°F	total	275
21C		Saybolt Viscosity	79°	to	87°C	0.1°C	total	275
21F		Saybolt Viscosity	174°	to	188°F	0.2°F	total	275
22C	(24C)	Oxidation Stability	95°	to	103°C	0.1°C	total	275
22F	(24F)	Oxidation Stability	204°	to	218°F	0.2°F	total	275
23C		Engler Viscosity	18°	to	28°C	0.2°C	90	212
24C		Engler Viscosity	39°	to	54°C	0.2°C	90	237
25C		Engler Viscosity	95°	to	105°C	0.2°C	90	212
26C		Stability Soluble Nitrocellulose	130°	to	140°C	0.1°C	total	463
27C		Turpentine Distillation	147°	to	182°C	0.5°C	76	301
28C	(31C)	Kinematic Viscosity	36.6°	to	39.4°C	0.05°C	total	305
28F	(31F)	Kinematic Viscosity	97.5°	to	102.5°F	0.1°F	total	305
29C	(34C)	Kinematic Viscosity	52.6°	to	55.4°C	0.05°C	total	305
29F	(34F)	Kinematic Viscosity	127.5°	to	132.5°F	0.1°F	total	305
30F	(32F)	Kinematic Viscosity	207.5°	to	212.5°F	0.1°F	total	305
33C	(20C)	Low Aniline Point	-38°	to	+42°C	0.2°C	50	420

ASTM	(IP)	APPLICATION/TYPE	RANGE			A	B	C
33F		Low Aniline Point	-36.5°	to	107.5°F	0.5°F	50	420
34C	(21C)	Medium Aniline Point	25°	to	105°C	0.2°C	50	420
34F		Medium Aniline Point	77°	to	221°F	0.5°F	50	420
35C	(59C)	High Aniline Point	90°	to	170°C	0.2°C	50	420
35F		High Aniline Point	194°	to	338°F	0.5°F	50	420
36C		Titer Test	-2°	to	+68°C	0.2°C	45	405
37C	(77C)	Solvents Distillation	-2°	to	+52°C	0.2°C	100	395
38C	(78C)	Solvents Distillation	24°	to	78°C	0.2°C	100	395
39C	(79C)	Solvents Distillation	48°	to	102°C	0.2°C	100	395
40C	(80C)	Solvents Distillation	72°	to	126°C	0.2°C	100	395
41C	(81C)	Solvents Distillation	98°	to	152°C	0.2°C	100	395
42C	(82C)	Solvents Distillation	95°	to	255°C	0.5°C	100	395
43C	(65C)	Kinematic Viscosity	-51.6°	to	-34°C	0.1°C	total	420
43F	(65F)	Kinematic Viscosity	-61°	to	-29°F	0.2°F	total	420
44C	(29C)	Kinematic Viscosity	18.6°	to	21.4°C	0.05°C	total	305
44F	(29F)	Kinematic Viscosity	66.5°	to	71.5°F	0.1°F	total	305
45C	(30C)	Kinematic Viscosity	23.6°	to	26.4°C	0.05°C	total	305
45F	(30F)	Kinematic Viscosity	74.5°	to	79.5°F	0.1°F	total	305
46C	(66C)	Kinematic Viscosity	48.6°	to	51.4°C	0.05°C	total	305
46F	(66F)	Kinematic Viscosity	119.5°	to	124.5°F	0.1°F	total	305
47C	(35C)	Kinematic Viscosity	58.6°	to	61.4°C	0.05°C	total	305
47F	(35F)	Kinematic Viscosity	137.5°	to	142.5°F	0.1°F	total	305
48C	(90C)	Kinematic Viscosity	80.6°	to	83.4°C	0.05°C	total	305
48F	(90F)	Kinematic Viscosity	177.5°	to	182.5°F	0.1°F	total	305
49C		Stormer Viscosity	20°	to	70°C	0.2°C	65	305
50F		Gas Calorimeter Inlet	54°	to	101°F	0.1°F	total	468
51F		Gas Calorimeter Outlet	69°	to	116°F	0.1°F	total	468
52C		Butadiene Boiling Point Range	-10°	to	+5°C	0.1°C	total	162
54C	(18C)	Congealing Point	20°	to	100.6°C	0.2°C	total	310
54F	(18F)	Congealing Point	68°	to	213°F	0.5°F	total	310
56C		Bomb Calorimeter	19°	to	35°C	0.02°C	total	600
56F		Bomb Calorimeter	66°	to	95°F	0.05°F	total	600
57C		Tag Closed Cup Tester Low Range	-20°	to	+50°C	0.5°C	57	287
57F		Tag Closed Tester	-4°	to	+122°F	1°F	57	287
58C		Tank	-34°	to	+49°C	0.5°C	total	305
58F		Tank	-30°	to	+120°F	1°F	total	305
59C		Tank	-18°	to	+82°C	0.5°C	total	305
59F		Tank	0°	to	180°F	1°F	total	305
60C		Tank	77°	to	260°C	1°C	total	305
60F		Tank	170°	to	500°F	2°F	total	305
61C	(63C)	Petrolatum Melting Point	32°	to	127°C	0.2°C	79	380
61F		Petrolatum Melting Point	90°	to	260°F	0.5°F	79	380
62C		Precision	-38°	to	+2°C	0.1°C	total	379
62F		Precision	-36°	to	+35°F	0.2°F	total	379
63C		Precision	-8°	to	+32°C	0.1°C	total	379
63F		Precision	18°	to	89°F	0.2°F	total	379
64C		Precision	25°	to	55°C	0.1°C	total	379
64F		Precision	77°	to	131°F	0.2°F	total	379
65C		Precision	50°	to	80°C	0.1°C	total	379
65F		Precision	122°	to	176°F	0.2°F	total	379
66C		Precision	75°	to	105°C	0.1°C	total	379
66F		Precision	167°	to	221°F	0.2°F	total	379

ASTM THERMOMETERS

CONFORMANCE CERTIFICATE *To order a thermometer with a works conformance certificate, quote the IP or ASTM part number (i.e. IP39C).*

CALIBRATION CERTIFICATE (UKAS) *To order a thermometer with a UKAS calibration certificate, add the suffix Z to the IP or ASTM part number (i.e. IP39CZ).*

ASTM THERMOMETERS (ASTM E1)

ASTM	(IP)	APPLICATION/TYPE	RANGE			A	B	C
67C		Precision	95°	to	155°C	0.2°C	total	379
67F		Precision	203°	to	311°F	0.5°F	total	379
68C		Precision	145°	to	205°C	0.2°C	total	379
68F		Precision	293°	to	401°F	0.5°F	total	379
69C		Precision	195°	to	305°C	0.5°C	total	379
69F		Precision	383°	to	581°F	1°F	total	379
70C		Precision	295°	to	405°C	0.5°C	total	379
70F		Precision	563°	to	761°F	1°F	total	379
71C	(72C)	Oil in Wax	-37°	to	+21°C	0.5°C	76	355
71F	(72F)	Oil in Wax	-35°	to	+70°F	1°F	76	355
72C	(67C)	Kinematic Viscosity	-19.4°	to	-16.6°C	0.05°C	total	305
72F	(67F)	Kinematic Viscosity	-2.5°	to	+2.5°F	0.1°F	total	305
73C	(68C)	Kinematic Viscosity	-41.4°	to	-38.6°C	0.05°C	total	305
73F	(68F)	Kinematic Viscosity	-42.5°	to	-37.5°F	0.1°F	total	305
74C	(69C)	Kinematic Viscosity	-55.4°	to	-52.6°C	0.05°C	total	305
74F	(69F)	Kinematic Viscosity	-67.5°	to	-62.5°F	0.1°F	total	305
75F		Anti-freeze Freezing Point	-35°	to	+35°F	0.5°F	100	408
76F		Anti-freeze Freezing Point	-65°	to	+5°F	0.5°F	100	408
77F		Saybolt Viscosity	245°	to	265°F	0.5°F	total	275
78F		Saybolt Viscosity	295°	to	315°F	0.5°F	total	275
79F		Saybolt Viscosity	345°	to	365°F	0.5°F	total	275
80F		Saybolt Viscosity	395°	to	415°F	0.5°F	total	275
81F		Saybolt Viscosity	445°	to	465°F	0.5°F	total	275
82C		Fuel Rating, Engine	-15°	to	+105°C	1°C	30	162
82F		Fuel Rating, Engine	0°	to	220°F	2°F	30	162
83C		Fuel Rating, Air	15°	to	70°C	1°C	40	171
83F		Fuel Rating, Air	60°	to	160°F	1°F	40	171
84C		Fuel Rating, Orifice Tank	25°	to	80°C	1°C	249	383
84F		Fuel Rating, Orifice Tank	75°	to	175°F	1°F	249	383
85C		Fuel Rating, Surge	40°	to	150°C	1°C	181	310
85F		Fuel Rating, Surge	100°	to	300°F	2°F	181	310
86C		Fuel Rating, Mix	95°	to	175°C	1°C	35	167
86F		Fuel Rating, Mix	200°	to	350°F	2°F	35	167
87C		Fuel Rating, Coolant	150°	to	205°C	1°C	40	172
87F		Fuel Rating, Coolant	300°	to	400°F	1°F	40	172
88C		Vegetable Oil Flash	10°	to	200°C	1°C	57	287
88F		Vegetable Oil Flash	50°	to	392°F	2°F	57	287
89C		Solidification Point	-20°	to	+10°C	0.1°C	76	370
90C		Solidification Point	0°	to	30°C	0.1°C	76	370
91C		Solidification Point	20°	to	50°C	0.1°C	76	370
92C		Solidification Point	40°	to	70°C	0.1°C	76	370
93C		Solidification Point	60°	to	90°C	0.1°C	76	370
94C		Solidification Point	80°	to	110°C	0.1°C	76	370
95C		Solidification Point	100°	to	130°C	0.1°C	76	370
96C		Solidification Point	120°	to	150°C	0.1°C	76	370
97C		Tank	-18°	to	+49°C	0.5°C	total	305
97F		Tank	0°	to	120°F	1°F	total	305
98C		Tank	16°	to	82°C	0.5°C	total	305
98F		Tank	60°	to	180°F	1°F	total	305
99C		Weathering Test	-50°	to	5°C	0.2°C	35	302
99F		Weathering Test	-58°	to	+41°F	0.5°F	35	302
100C		Solidification Point	145°	to	205°C	0.2°C	76	370
101C		Solidification Point	195°	to	305°C	0.5°C	76	370

ASTM	(IP)	APPLICATION/TYPE	RANGE			A	B	C
102C	(83C)	Solvents Distillation	123°	to	177°C	0.2°C	100	395
103C	(84C)	Solvents Distillation	148°	to	202°C	0.2°C	100	395
104C	(85C)	Solvents Distillation	173°	to	227°C	0.2°C	100	395
105C	(86C)	Solvents Distillation	198	to	252°C	0.2°C	100	395
106C	(87C)	Solvents Distillation	223°	to	277°C	0.2°C	100	395
107C	(88C)	Solvents Distillation	248°	to	302°C	0.2°C	100	395
108F		Saybolt Viscosity	270°	to	290°F	0.5°F	total	275
109F		Saybolt Viscosity	320°	to	340°F	0.5°F	total	275
110C	(93C)	Kinematic Viscosity	133.6°	to	136.4°C	0.05°C	total	305
110F		Kinematic Viscosity	272.5°	to	277.5°F	0.1°F	total	305
111C		Tar Acids Distillation	170°	to	250°C	0.2°C	100	395
112C		Solidification Point of Benzene	4°	to	6°C	0.02°C	total	215
113C	(89C)	Softening Point Wide Range	-1°	to	+175°C	0.5°C	total	405
113F	(89F)	Softening Point Wide Range	30°	to	350°F	1°F	total	405
114C	(14C)	Aviation Fuel Freezing Point	-80°	to	+20°C	0.5°C	total	300
116C		Bomb Calorimeter	18.9°	to	25.1°C	0.01°C	total	609
117C		Bomb Calorimeter	23.9°	to	30.1°C	0.01°C	total	609
118C		Kinematic Viscosity	28.6°	to	31.4°C	0.05°C	total	305
118F		Kinematic Viscosity	83.5°	to	88.5°F	0.1°F	total	305
119C		Anti-freeze Freezing Point	-38.3°	to	-30°C	0.1°C	100	420
119F		Anti-freeze Freezing Point	-37°	to	-22°F	0.2°F	100	420
120C	(92C)	Kinematic Viscosity	38.6°	to	41.4°C	0.05°C	total	305
121C	(32C)	Kinematic Viscosity	98.6°	to	101.4°C	0.05°C	total	305
122C	(94C)	Brookfield Viscosity	-45°	to	-35°C	0.1°C	total	300
123C	(95C)	Brookfield Viscosity	-35°	to	-25°C	0.1°C	total	300
124C	(96C)	Brookfield Viscosity	-25°	to	-15°C	0.1°C	total	300
125C	(97C)	Brookfield Viscosity	-15°	to	-5°C	0.1°C	total	300
126C	(71C)	Kinematic Viscosity	-27.4°	to	-24.6°C	0.05°C	total	305
126F	(71F)	Kinematic Viscosity	-17.5°	to	-12.5°F	0.1°F	total	305
127C	(99C)	Kinematic Viscosity	-21.4°	to	-18.6°C	0.05°C	total	305
128C	(33C)	Kinematic Viscosity	-1.4°	to	+1.4°C	0.05°C	total	305
128F	(33F)	Kinematic Viscosity	29.5°	to	34.5°F	0.1°F	total	305
129C	(36C)	Kinematic Viscosity	91.6°	to	94.4°C	0.05°C	total	305
129F	(36F)	Kinematic Viscosity	197.5°	to	202.5°F	0.1°F	total	305
130C		Tank	-7°	to	+105°C	0.5°C	total	303
130F		Tank	20°	to	220°F	1°F	total	303
132C	(102C)	Kinematic Viscosity	148.6°	to	154.4°C	0.05°C	total	305
133C		Precision	-38°	to	+2°C	0.1°C	76	384
134C		Sludge	144°	to	156°C	0.2°C	100	270
135C		Fuel Rating Air-High	38°	to	93°C	1°C	40	168
135F		Fuel Rating Air-High	100°	to	200°F	1°F	40	168
136C		Aviation Fuel Density	-20°	to	+60°C	0.2°C	total	285
136F		Aviation Fuel Density	-5°	to	+140°F	0.5°F	total	285
137C		Oxidation Cell Test	80°	to	100°C	0.1°F	76	250

TEMPERATURE CONVERSION FORMULAE

$$°C = \frac{5(°F - 32)}{9} \qquad °F = \frac{(°C \times 9)+32}{5}$$

IP THERMOMETERS

All Seta ASTM - IP thermometers are manufactured in accordance with ASTM E-1 and E-77 requirements.

KEY:- A=Graduations (minimum) B=Immersion Depth in mm C=Approximate Total Length in mm

Where numbers appear in both ASTM and IP columns they are jointly agreed equivalents

IP THERMOMETERS (IP APPENDIX 1)

IP	(ASTM)	APPLICATION/TYPE	RANGE			A	B	C
1C	(5C)	Cloud and Pour	-38°	to	+50°C	1°C	108	230
1F	(5F)	Cloud and Pour	-36°	to	+120°F	2°F	108	230
2C	(6C)	Low Cloud and Pour	-80°	to	+20°C	1°C	76	230
2F	(6F)	Low Cloud and Pour	-112°	to	+70°F	2°F	76	230
3C		Demulsification	-1°	to	+105°C	0.5°C	total	-
3F		Demulsification	30°	to	220°F	1°F	total	-
4C		Crude Oil Distillation	-4°	to	+360°C	2°C	total	310
5C	(7C)	Low Distillation	-2°	to	+300°C	1°C	total	385
6C	(8C)	High Distillation	-2°	to	+400°C	1°C	total	385
8C		Flushing Case Low	0°	to	45°C	0.2°C	65	340
9C		Flushing Case Medium	40°	to	85°C	0.2°C	65	340
14C	(114C)	Aviation Fuel Freezing Point	-80°	to	+20°C	0.5°C	total	300
15C	(9C)	Low Pensky-Martens	-5°	to	+110°C	0.5°C	57	290
15F	(9F)	Low Pensky-Martens	20°	to	230°F	1°F	57	290
16C	(10C)	High Pensky-Martens	90°	to	370°C	2°C	57	290
16F	(10F)	High Pensky-Martens	200°	to	700°F	5°F	57	290
17C	(14C)	Wax Melting Point	38°	to	82°C	0.1°C	79	375
17F	(14F)	Wax Melting Point	100°	to	180°F	0.2°F	79	375
18C	(54C)	Congealing Point	20°	to	100.6°C	0.2°C	total	312
20C	(33C)	Low Aniline Point	-38°	to	+42°C	0.2°C	50	420
21C	(34C)	Medium Aniline Point	25°	to	105°C	0.2°C	50	420
22C		Oxidation	195°	to	205°C	0.1°C	100	300
23C	(18C)	Reid Vapour Pressure	34°	to	42°C	0.1°C	total	275
23F	(18F)	Reid Vapour Pressure	94°	to	108°F	0.2°F	total	275
24C	(22C)	Oxidation Stability	95°	to	103°C	0.1°C	total	275
24F	(22F)	Oxidation Stability	204°	to	218°F	0.2°F	total	275
28C	(11C)	Cleveland Open Flash	-6°	to	+400°C	2°C	25	310
28F	(11F)	Cleveland Open Flash	20°	to	760°F	5°F	25	310
29C	(44C)	Kinematic Viscosity	18.6°	to	21.4°C	0.05°C	total	305
29F	(44F)	Kinematic Viscosity	66.5°	to	71.5°F	0.1°F	total	305
30C	(45C)	Kinematic Viscosity	23.6°	to	26.4°C	0.05°C	total	305
30F	(45F)	Kinematic Viscosity	74.5°	to	79.5°F	0.1°F	total	305
31C	(28C)	Kinematic Viscosity	36.6°	to	39.4°C	0.05°C	total	305
31F	(28F)	Kinematic Viscosity	97.5°	to	102.5°F	0.1°F	total	305
32C	(121C)	Kinematic Viscosity	98.6°	to	101.4°C	0.05°C	total	305
32F	(30F)	Kinematic Viscosity	208.5°	to	213.5°F	0.1°F	total	305
33C	(128C)	Kinematic Viscosity	-1.4°	to	+1.4°C	0.05°C	total	305
33F	(128F)	Kinematic Viscosity	29.5°	to	34.5°F	0.1°F	total	305
34C	(29C)	Kinematic Viscosity	52.6°	to	55.4°C	0.05°C	total	305
34F	(29F)	Kinematic Viscosity	127°	to	133°F	0.1°F	total	305
35C	(47C)	Kinematic Viscosity	58.6°	to	61.4°C	0.05°C	total	305
35F	(47F)	Kinematic Viscosity	137.5°	to	142.5°F	0.1°F	total	305
36C	(129C)	Kinematic Viscosity	91.6°	to	94.4°C	0.05°C	total	305
36F	(129F)	Kinematic Viscosity	197.5°	to	202.5°F	0.1°F	total	305
37C		Sludge	144°	to	156°C	0.2°C	100	270
38C		Penetration	23°	to	27°C	0.1°C	total	260
39C		Density	-1°	to	+38°C	0.1°C	total	440
39F		Relative Density	30°	to	100°F	0.2°F	total	440
40C		Drop Point Low	20°	to	120°C	1°C	100	250
41C		Drop Point High	100°	to	230°C	1°C	100	250
42C		Breaking Point	-38°	to	+30°C	0.5°C	250	370
43C		FP Cut-Back (Int)	10°	to	110°C	0.5°C	-	305

IP	(ASTM)	APPLICATION/TYPE	RANGE			A	B	C
43F		FP Cut-Back (Int)	50°	to	230°F	1°F	-	305
44C		FP Cut-Back (Ext)	15°	to	121°C	0.5°C	-	305
44F		FP Cut-Back (Ext)	60°	to	250°F	1°F	-	305
45C		Refractometer	15°	to	30°C	0.2°C	22	160
46C		Gravity Balance	14.5°	to	21°C	0.1°C	total	160
46F		Gravity Balance	58°	to	70°F	0.2°F	total	160
47C	(13C)	Loss on Heating	155°	to	170°C	0.5°C	total	155
48C		Tank Low	-38°	to	+30°C	0.5°C	total	310
49C		Tank Medium	-15°	to	+40°C	0.5°C	total	310
50C		Tank High	10°	to	65°C	0.5°C	total	310
51C		Tank Heated Fuel	35°	to	120°C	0.5°C	total	310
52C		Tank Bitumen	90°	to	260°C	1°C	total	310
53C		Tank Cargo	0°	to	80°C	0.5°C	total	310
59C	(35C)	High Aniline Point	90°	to	170°C	0.2°C	50	420
60C	(15C)	Low Softening Point	-2°	to	+80°C	0.2°C	total	395
61C	(16C)	High Softening Point	30°	to	200°C	0.5°C	total	395
62C	(2C)	Partial Immersion	-5°	to	+300°C	1°C	76	390
62F	(2F)	Partial Immersion	20°	to	580°F	2°F	76	390
63C	(61C)	Petrolatum Melting Point	32°	to	127°C	0.2°C	79	380
64C	(12C)	Density-Wide Range	-20°	to	+102°C	0.2°C	total	420
64F	(12F)	Relative Density Wide Range	-5°	to	+215°F	0.5°F	total	420
65C		Kinematic Viscosity Low	-51.6°	to	-34°C	0.1°C	total	420
65F	(43F)	Kinematic Viscosity Low	-61°	to	-29°F	0.2°F	total	420
66C	(46C)	Kinematic Viscosity	48.6°	to	51.4°C	0.05°C	total	305
66F	(46F)	Kinematic Viscosity	119.5°	to	124.5°F	0.1°F	total	305
67C	(72C)	Kinematic Viscosity	-19.4°	to	-16.6°C	0.05°C	total	305
67F	(72F)	Kinematic Viscosity	-2.5°	to	+2.5°F	0.1°F	total	305
68C	(73C)	Kinematic Viscosity	-41.4°	to	-38.6°C	0.05°C	total	305
68F	(73F)	Kinematic Viscosity	-42.5	to	-37.5°F	0.1°F	total	305
69C	(74C)	Kinematic Viscosity	-55.4°	to	-52.6°C	0.05°C	total	305
69F	(74F)	Kinematic Viscosity	-67.5°	to	62.5°F	0.1°F	total	305
71C	(126C)	Kinematic Viscosity	-27.4°	to	-24.6°C	0.05°C	total	305
71F	(126F)	Kinematic Viscosity	-17.5°	to	12.5°F	0.1°F	total	305
72C	(71C)	Oil in Wax	-37°	to	+21°C	0.5°C	76	355
72F	(71F)	Oil in Wax	-35°	to	+70°F	1°F	76	355
73C	(3C)	Partial Immersion	-5°	to	+400°C	1°C	76	415
73F	(3F)	Partial Immersion	20°	to	760°F	2°F	76	415
74C		Abel Oil Cup Wide Range	-35°	to	+70°C	0.5°C	61	310
74F		Abel Oil Cup Wide Range	-35°	to	160°F	1°F	61	310
75C		Abel Water Bath Wide Range	-30°	to	+80°C	0.5°C	89	310
75F		Abel Water Bath Wide Range	-25°	to	+180°F	1°F	89	310
76C		Engler Viscosity	10°	to	55°C	0.5°C	93	240
77C	(37C)	Solvents Distillation	-2°	to	+52°C	0.2°C	100	395
78C	(38C)	Solvents Distillation	24°	to	78°C	0.2°C	100	395
79C	(39C)	Solvents Distillation	48°	to	102°C	0.2°C	100	395
80C	(40C)	Solvents Distillation	72°	to	126°C	0.2°C	100	395
81C	(41C)	Solvents Distillation	98°	to	152°C	0.2°C	100	395
82C	(42C)	Solvents Distillation	95°	to	255°C	0.5°C	100	395
83C	(102C)	Solvents Distillation	123°	to	177°C	0.2°C	100	395
84C	(103C)	Solvents Distillation	148°	to	202°C	0.2°C	100	395
85C	(104C)	Solvents Distillation	173°	to	227°C	0.2°C	100	395

IP THERMOMETERS

CONFORMANCE CERTIFICATE *To order a thermometer with a works conformance certificate, quote the IP or ASTM part number (i.e. IP39C).*

CALIBRATION CERTIFICATE (UKAS) *To order a thermometer with a UKAS calibration certificate, add the suffix Z to the IP or ASTM part number (i.e. IP39CZ).*

IP THERMOMETERS (IP APPENDIX 1)

IP	(ASTM)	APPLICATION/TYPE	RANGE			A	B	C
85C	(104C)	Solvents Distillation	173°	to	227°C	0.2°C	100	395
86C	(105C)	Solvents Distillation	198°	to	252°C	0.2°C	100	395
87C	(106C)	Solvents Distillation	223°	to	277°C	0.2°	100	395
88C	(107C)	Solvents Distillation	248°	to	302°C	0.2°C	100	395
89C	(113C)	Softening Point Wide Range	-1°	to	+175°C	0.5°C	total	405
89F	(113F)	Softening Point Wide Range	30°	to	350°F	1°F	total	405
90C	(48C)	Kinematic Viscosity 82.2°C	80.6°	to	83.4°C	0.05°C	total	305
90F	(48F)	Kinematic Viscosity	177.5	to	182.5°F	0.1°F	total	305
91C		Rapid Flash Point	0°	to	110°C	1°C	44	200
92C	(120C)	Kinematic Viscosity 40°C	38.6°	to	41.4°C	0.05°C	total	305
93C	(110C)	Kinematic Viscosity 135°C	133.6°	to	136.4°C	0.05°C	total	280
94C	(122C)	Brookfield Viscosity	-45°	to	-35°C	0.1°C	total	300
95C	(123C)	Brookfield Viscosity	-35°	to	-25°C	0.1°C	total	300
96C	(124C)	Brookfield Viscosity	-25°	to	-15°C	0.1°C	total	300
97C	(125C)	Brookfield Viscosity	-15°	to	-5°C	0.1°C	total	300
98C		Rapid Flash Point High	100°	to	300°C	2°C	44	200
99C	(127C)	Kinematic Viscosity -20°C	-21.4°	to	-18.6°C	0.05°C	total	305
100C		Kinematic Viscosity 80°C	78.6°	to	81.4°C	0.05°C	total	305
101C		Medium Pensky-Martens	20°	to	150°C	1°C	57	290
102C	(132C)	Kinematic Viscosity 150°C	148.6°	to	151.4°C	0.05°C	total	310

TEMPERATURE CONVERSION FORMULAE

$$°C = \frac{5(°F - 32)}{9} \qquad °F = \frac{(°C \times 9)+32}{5}$$

NON MERCURY LIQUID IN GLASS THERMOMETERS

A 550mm long thermometer with a 76mm immersion depth. Filled with a non-toxic 'green' expansion medium.

SUPPLIED WITH: a works test certificate (Add suffix Z to the part number to order a thermometer with a UKAS calibration certificate).

CALIBRATION CERTIFICATE (WORKS)

CALIBRATION CERTIFICATE (UKAS)

NON MERCURY THERMOMETERS			
Seta Part No. Works Calibrated	**UKAS Calibrated**	**Range**	**Graduations**
99945-0	99945-0Z	-5 to +105°C	0.1°C

99945-0

PROTECTIVE CASES & HOLDERS

PROTECTIVE ARMOUR THERMOMETER CASES

A brass tube with a suspension ring at the top, a perforated bulb cage and a slotted side for easy reading of the thermometer. Suitable for most thermometers (approx 8mm internal diameter).

87500-0	305mm max thermometer length
87510-0	405mm max thermometer length

87520-0 ASTM/IP TANK SAMPLING THERMOMETER CASE

A non-sparking design for use with ASTM/IP tank dipping thermometers (see table below) to take sample temperature from a storage tank. Fitted with a retaining handle at the top of the case for attaching a cord and a 100ml cup at the bottom for collecting the sample.

ASTM/IP TANK DIPPING THERMOMETERS

ASTM	Description	Range	IP	Description	Range
58C	Tank	-34 to +49°C	48C	Tank, Low	-38 to 30C°
58F	Tank	-30 to +120F°	49C	Tank, Medium	-15 to 40°C
59C	Tank	-18 to +82°C	50C	Tank, High	10 to 65C°
59F	Tank	0 to 180F°	51C	Tank, Heated Fuel	35 to 120°C
60C	Tank	77 to 260°C	52C	Tank, Bitumen	90 to 260°C
60F	Tank	170 to 500°F	53C	Tank, Cargo	0 to 80°C
97C	Tank	0 to 120°F			
98C	Tank	16 to 82C°			
98F	Tank	60 to 180°F			

87530-0 LAB HOLDER

A thermally insulated support that clips onto the side of a beaker or container, allowing thermometers and probes to be suspended at the correct immersion depth without contacting the sides of the container. The flexible probe mounting disk has 15mm, 10mm, 6mm, 5mm and 3mm holes to accept most probes and thermometers. The jaws of the spring loaded clip has thick pads to firmly grip onto glass walled containers.

WIDE RANGE DIGITAL THERMOMETERS

99940-0 SETA DIGI-PETRO THERMOMETER

- -80 to 450°C temperature range
- ±0.02°C accuracy between -20 to 120°C
- Unique glass temperature sensor
- Dual temperature display
- Suitable for hand held or bench top use

The high performance Digi-Petro thermometer is an alternative to a mercury thermometer and is specifically designed to measure temperature in conformoity with ASTM, IP and other standards used in the hydrocarbon industry and where such thermometers are the temperature reference.

The instrument measures temperature over the range of -80 to 450°C with a precision of better than ± 0.02°C between -20 to 120°C. It has a dual temperature display with facility to connect up to 2 sensor probes simultaneously.

The instrument has a unique glass temperature sensor made of thermally stable glass and designed to simulate the response time and immersion characteristics of the equivalent ASTM or IP thermometer and has the same dimensions as a typical mercury thermometer.

There are dual display/channels allowing 2 simultaneous temperature measurements using an optional second sensor.

An integral programme allows the user to select 'start' and 'interval' temperature points and to set an audible alarm to activate as each temperature is reached. For example, at the required 'dip point' during a flash point test.

SPECIFICATIONS

Temperature Range:	-80 to 450°C
Resolution:	0.01°C
Ch 1 Precision:	Better than ±0.02°C (between -20 to 120°C) ±0.4°C (full range)
Ch 2 Precision:	±0.15°C and 0.2% of range
Temperature Stability:	5ppm/c
Audible Alarm Start:	Increments of 1.0°C
Audible Alarm Interval:	Increments of 0.1°C
Power Supply:	LR61 battery of 220/240V adaptor (supplied)
Size (HxWxD):	20 x 6.8 x 3.5cm
Sensor Dimensions:	Glass body 11 x 0.6cm (22 overall length)
Sensor Cable:	1m
Weight:	270gm

PRECISION DIGITAL THERMOMETER

SETADIGIT CALIBRATED DIGITAL PRECISION THERMOMETERS

- 30 to 50°C and 90 to 110°C models
- ±0.04°C accuracy
- 4 second response time

Hand held secondary reference thermometers with a resolution of 0.01°C, and an accuracy of ±0.04°C while retaining a response time of less than 4 seconds. Measurement is made by a fixed probe on 1m cable. Functions include 'Maximum/Minimum' and 'Hold'.

SUPPLIED WITH: probe and cable, carry case, battery and instructions.

Seta Part No.	Range
99920-0	30 to 50°C
99925-0	90 to 110°C

SPECIFICATIONS	
Resolution:	0.01°C
Accuracy:	± 0.04°C
Power Supply:	9V 6F22 (PP3) Alkaline Battery
Size (HxWxD):	12 x 6 x 2.5cm
Weight:	1kg

CALIBRATION CERTIFICATE (WORKS)

99925-0

RECORDING DIGITAL THERMOMETER

99928-0 SETATHERM

- Suitable for D445 verification
- -20 to 150°C temperature range
- Precision ± 0.01°C
- PT 1000 probe
- Temperature logging (software supplied)
- 2 point calibration certificate

Designed for high accuracy applications such as the precise temperature verification of viscometer baths, SetaTherm is also suitable for verification of liquid in glass thermometers and digital temperature display devices.

SetaTherm has a stainless steel PT 1000 immersion probe, 150mm long x 3.5mm dia., with a 100mm immersion depth and calibrated at 40 and 100°C. Accuracy: from -20 to 0°C = ±0.05°C, from 0 to 50°C = ±0.01°C, from 50 to 100°C = ±0.02°C, from 100 to 150°C = ±0.04°C.

The SetaVisco software allows data to be downloaded onto a personal computer via an RS232 port.

SUPPLIED WITH: probe with 1.2m cable, power supply, carry case, software, computer cable, and user instructions.

99928-0

SPECIFICATIONS	
Range:	-20 to 150°C
Resolution:	0.001°C switchable to 0.01°C
Accuracy:	± 0.01°C @ 40°C and 100°C
Power Supply:	9v power supply or 9V 6F22 (PP3) Alkaline Battery
Size (HxWxD):	15 x 8 x 3.2cm
Weight:	0.5kg

CALIBRATION CERTIFICATE (WORKS)

SOFTWARE INCLUDED

TECHNICAL DATASHEETS AVAILABLE

20

WIDE RANGE DIGITAL THERMOMETERS

99922-0 SETA DIGITAL THERMOMETER

- -40 to 150°C temperature range
- 3 second response time
- Calibrated for Vapour Pressure tests verification

A digital thermometer with a temperature range of -40 to 150°C, a rapid response time of only 3 seconds, and optimised for temperature measurement in vapour pressure tests.

The thermometer is equipped with a 110 x 2.5mm stainless steel probe that has the element in the last 10mm of the tip and has been calibrated at 37.8°C (100°F), making it ideal for the calibration and verification of Setavap instruments.

SUPPLIED WITH: probe with 1.2m cable, battery and user instructions.

CALIBRATION CERTIFICATE (WORKS)

SPECIFICATIONS	
Range:	-40 to 150°C
Resolution:	0.1°C
Accuracy:	± 0.1°C @ 37.8°C (100°F)
Power Supply:	9V 6F22 (PP3) Alkaline Battery
Size (HxWxD):	11.5 x 6.5 x 2.6cm
Weight:	0.5kg

99922-0

99927-0 DIGITAL THERMOMETER WITH INTERCHANGEABLE PROBES

- -50 to 300°C range
- Immersion, contact, and flexible probes
- Suitable for liquids, gases and solids

A compact PT100 electronic thermometer with clear display and fast response time. The interchangeable temperature probes are connected to the handheld display via 1m cables.

The probes included are for the following applications; liquid (immersion), solids (surface) and air & gases. A flexible probe for general use is also included.

SUPPLIED WITH: four probes with leads, carry case, battery and user instructions.

CALIBRATION CERTIFICATE (WORKS)

SPECIFICATIONS	
Range:	-50 to 300°C
Resolution:	0.1°C
Accuracy:	± 0.5°C (1%)
Power Supply:	9V 6F22 (PP3) Alkaline Battery
Size (HxWxD):	9 x 6 x 2.5cm
Weight:	1.2kg

99927-0

ASTM HYDROMETERS

All Seta Glass Hydrometers are manufactured from sodalime-silicate glass with a linear coefficient of expansion of 9.2 x 10-6. They are shot-poised and calibrated for use in liquids of LOW surface tension (15 to 34 dynes/cm).

CONFORMANCE CERTIFICATE *To order a thermometer with a works conformance certificate, quote the IP or ASTM part number (i.e. IP39C).*

CALIBRATION CERTIFICATE (UKAS) *To order a thermometer with a UKAS calibration certificate, add the suffix Z to the IP or ASTM part number (i.e. IP39CZ).*

ASTM HYDROMETER AND THERMOHYDROMETER QUICK SELECTION GUIDE

ASTM Ref to SETA PART No.

ASTM REF	SETA PART	RANGE (°API)	RANGE (SG)	E100 SERIES	TYPE
1H	12355/01	-1 to 11		Long @60°F	API Gravity
2H	12355/02	9 to 21		Long @60°F	API Gravity
3H	12355/03	19 to 31		Long @60°F	API Gravity
4H	12355/04	29 to 41		Long @60°F	API Gravity
5H	12355/05	39 to 51		Long @60°F	API Gravity
6H	12355/06	49 to 61		Long @60°F	API Gravity
7H	12355/07	59 to 71		Long @60°F	API Gravity
8H	12355/08	69 to 81		Long @60°F	API Gravity
9H	12355/09	79 to 91		Long @60°F	API Gravity
10H	12355/10	89 to 101		Long @60°F	API Gravity
21H	12356/01	0 to 6		Short @60°F	API Gravity
22H	12356/02	5 to 11		Short @60°F	API Gravity
23H	12356/03	10 to 16		Short @60°F	API Gravity
24H	12356/04	15 to 21		Short @60°F	API Gravity
25H	12356/05	20 to 26		Short @60°F	API Gravity
26H	12356/06	25 to 31		Short @60°F	API Gravity
27H	12356/07	30 to 36		Short @60°F	API Gravity
28H	12356/08	35 to 41		Short @60°F	API Gravity
29H	12356/09	40 to 46		Short @60°F	API Gravity
30H	12356/10	45 to 51		Short @60°F	API Gravity
31H	12356/11	50 to 56		Short @60°F	API Gravity
32H	12356/12	55 to 61		Short @60°F	API Gravity
33H	12356/13	60 to 66		Short @60°F	API Gravity
34H	12356/14	65 to 71		Short @60°F	API Gravity
35H	12356/15	70 to 76		Short @60°F	API Gravity
36H	12356/16	75 to 81		Short @60°F	API Gravity
37H	12356/17	80 to 86		Short @60°F	API Gravity
38H	12356/18	85 to 91		Short @60°F	API Gravity
39H	12356/19	90 to 96		Short @60°F	API Gravity
40H	12356/20	96 to 101		Short @60°F	API Gravity
81H	12351/01		0.600 to 0.650	Long @60°F	Sp. Gravity
82H	12351/02		0.650 to 0.700	Long @60°F	Sp. Gravity
83H	12351/03		0.700 to 0.750	Long @60°F	Sp. Gravity
84H	12351/04		0.750 to 0.800	Long @60°F	Sp. Gravity
85H	12351/05		0.800 to 0.850	Long @60°F	Sp. Gravity
86H	12351/06		0.850 to 0.900	Long @60°F	Sp. Gravity
67H	12351/07		0.900 to 0.950	Long @60°F	Sp. Gravity
88H	12351/08		0.950 to 1.000	Long @60°F	Sp. Gravity
89H	12351/09		1.000 to 1.050	Long @60°F	Sp. Gravity
90H	12351/10		1.050 to 1.100	Long @60°F	Sp. Gravity
102H	12352/01		0.650 to 0.700	Short @60°F	Sp. Gravity
103H	12352/02		0.700 to 0.750	Short @60°F	Sp. Gravity
104H	12352/03		0.750 to 0.800	Short @60°F	Sp. Gravity
105H	12352/04		0.800 to 0.850	Short @60°F	Sp. Gravity
106H	12352/05		0.850 to 0.900	Short @60°F	Sp. Gravity
107H	12352/06		0.900 to 0.950	Short @60°F	Sp. Gravity
108H	12352/07		0.950 to 1.000	Short @60°F	Sp. Gravity

ASTM Ref to SETA PART No.

ASTM REF	SETA PART	RANGE (°API)	TEMPERATURE	TYPE
51HL	12382/01	-1 to 11	0 to 150°F	Gr.Thermo
51HM	12383/01	-1 to 11	30 to 180°F	Gr.Thermo
51HH	12381/01	-1 to 11	60 to 220°F	Gr.Thermo
52HL	12382/02	9 to 21	0 to 150°F	Gr.Thermo
52HM	12383/02	9 to 21	30 to 180°F	Gr.Thermo
52HH	12381/02	9 to 21	60 to 220°F	Gr.Thermo
53HL	12382/03	19 to 31	0 to 150°F	Gr.Thermo
53HM	12383/03	19 to 31	30 to 180°F	Gr.Thermo
53HH	12381/03	19 to 31	60 to 220°F	Gr.Thermo
54HL	12382/04	29 to 41	0 to 150°F	Gr.Thermo
54HM	12383/04	29 to 41	30 to 180°F	Gr.Thermo
54HH	12381/04	29 to 41	60 to 220°F	Gr.Thermo
55HL	12382/05	39 to 51	0 to 150°F	Gr.Thermo
55HM	12383/05	39 to 51	30 to 180°F	Gr.Thermo
55HH	12381/05	39 to 51	60 to 220°F	Gr.Thermo
56HL	12382/06	49 to 61	0 to 150°F	Gr.Thermo
56HM	12383/06	49 to 61	30 to 180°F	Gr.Thermo
56HH	12381/06	49 to 61	60 to 220°F	Gr.Thermo
57HL	12382/07	59 to 71	0 to 150°F	Gr.Thermo
57HM	12383/07	59 to 71	30 to 180°F	Gr.Thermo
57HH	12381/07	59 to 71	60 to 220°F	Gr.Thermo
58HL	12382/08	69 to 81	0 to 150°F	Gr.Thermo
58HM	12383/08	69 to 81	60 to 220°F	Gr.Thermo
58HH	12381/08	69 to 81	60 to 220°F	Gr.Thermo
59HL	12382/09	79 to 91	0 to 150°F	Gr.Thermo
59HM	12383/09	79 to 91	30 to 180°F	Gr.Thermo
59HH	12381/09	79 to 91	60 to 220°F	Gr.Thermo
60HL	12382/10	89 to 101	0 to 150°F	Gr.Thermo
60HM	12383/10	89 to 101	30 to 180°F	Gr.Thermo
60HH	12381/10	89 to 101	60 to 220°F	Gr.Thermo

THERMOMETER SELECTION TABLE

Thermometers required when carrying out Relative Density (Specific Gravity) or API Gravity measurements with ASTM hydrometers.

ASTM Ref	IP Ref	Temp Range	ASTM D287	ASTM D1298
ASTM12F	IP64F	-5 to 215°F	●	●
ASTM12C	IP64C	-20 to 102°C		●
	IP39C	-1 to 38°C		●

CONFORMANCE CERTIFICATE (WORKS) *Quote the ASTM or IP part number (i.e. ASTM12C).*

CALIBRATION CERTIFICATE (UKAS) *Add the suffix Z to the IP or ASTM part number (i.e. ASTM12CZ).*

RELATIVE DENSITY (SPECIFIC GRAVITY) HYDROMETERS – ASTM E100/BS 718/ISO 649

12351/** RELATIVE DENSITY – ASTM E100 SERIES (LONG FORM) @ 60/60°F

12352/** RELATIVE DENSITY – ASTM E100 SERIES (SHORT FORM) @ 60/60°F

ASTM D1298; IP 160; API 2547; BS 4714 (obs); DIN 51 757; EN 3675; ISO 650; NF T60-101

12320/** RELATIVE DENSITY – BS 718/ISO 649 M50SP SERIES @ 60/60°F

12321/** RELATIVE DENSITY – BS 718/ISO 649 L50SP SERIES @ 60/60°F

ASTM D1298; IP 160; API 2547; BS 4714 (obs); DIN 51 757; EN 3675; ISO 650; NF T60-101; JIS K2249

RELATIVE DENSITY HYDROMETER SELECTION CHART

Range (SG)	E100 (Long) ASTM Ref	E100 (Long) Seta Part	E 100 (Short) ASTM Ref	E 100 (Short) Seta Part	M50SP Seta Part	L50SP Seta Part
0.600 to 0.650	81H	12351/01			12320/01	12321/01
0.650 to 0.700	82H	12351/02	102H	12352/01	12320/02	12321/02
0.700 to 0.750	83H	12351/03	103H	12352/02	12320/03	12321/03
0.750 to 0.800	84H	12351/04	104H	12352/03	12320/04	12321/04
0.800 to 0.850	85H	12351/05	105H	12352/04	12320/05	12321/05
0.850 to 0.900	86H	12351/06	106H	12352/05	12320/06	12321/06
0.900 to 0.950	87H	12351/07	107H	12352/06	12320/07	12321/07
0.950 to 1.000	88H	12351/08	108H	12352/07	12320/08	12321/08
1.000 to 1.050	89H	12351/09			12320/09	12321/09
1.050 to 1.100	90H	12351/10			12320/10	12321/10

SPECIFICATIONS

Seta Series:	12320	12321	12351	12352
BS/ISO Series:	M50SP	L50SP	E100 (Long)	E100 (Short)
Reference Temperature:	60/60°F	60/60°F	60/60°F	60/60°F
Length:	27cm	33.5cm	33.5cm	27cm
Scale Sub-Division:	0.001SG	0.0005SG	0.0005SG	0.001SG
Accuracy:	± 0.0006°SG	± 0.0003SG	± 0.0005SG	± 0.001SG

CONFORMANCE OR CALIBRATION CERTIFICATES (WORKS OR UKAS) AVAILABLE. (SEE PAGE 131 FOR DETAILS)

DENSITY HYDROMETERS – BS 718/ISO 649

12430/** DENSITY – BS 718/ISO 649 M50SP SERIES @ 15°C

12431/** DENSITY – BS 718/ISO 649 L50SP SERIES @ 15°C

ASTM D1298; IP 160; API 2547; BS 4714 (obs); DIN 51 757; EN 3675; ISO 650; NF T60-101

12460/** DENSITY – BS 718/ISO 649 M50 SERIES @ 20°C

12461/** DENSITY – BS 718/ISO 649 L50 SERIES @ 20°C

DENSITY HYDROMETER SELECTION CHART

Range (g/ml)	M50SP @ 15°C Seta Part	L50SP @ 15°C Seta Part	M50 @ 20°C Seta Part	L50 @ 20°C Seta Part
0.600 to 0.650	12430/01	12431/01	12460/01	12461/01
0.650 to 0.700	12430/02	12431/02	12460/02	12461/02
0.700 to 0.750	12430/03	12431/03	12460/03	12461/03
0.750 to 0.800	12430/04	12431/04	12460/04	12461/04
0.800 to 0.850	12430/05	12431/05	12460/05	12461/05
0.850 to 0.900	12430/06	12431/06	12460/06	12461/06
0.900 to 0.950	12430/07	12431/07	12460/07	12461/07
0.950 to 1.000	12430/08	12431/08	12460/08	12461/08
1.000 to 1.050	12430/09	12431/09	12460/09	12461/09
1.050 to 1.100	12430/10	12431/10	12460/10	12461/10

SPECIFICATIONS

Seta Series:	12430	12431	12460	12461
BS/ISO Series:	M50SP	L50SP	M50	L50
Reference Temperature:	15°C	15°C	20°C	20°C
Length:	27cm	33.5cm	27cm	33.5cm
Scale Sub-Division:	0.001g/ml	0.0005g/ml	0.001g/ml	0.0005g/ml
Accuracy:	± 0.0006g/ml	± 0.0003g/ml	± 0.0006g/ml	± 0.0003g/ml

CONFORMANCE OR CALIBRATION CERTIFICATES (WORKS OR UKAS) AVAILABLE. (SEE PAGE 131 FOR DETAILS)

12384-0 JET TURBINE FUEL HYDROMETER

ASTM D1298; D1655; DEF STAN 91-91; IP 160

A BS718 M50SP hydrometer specifically calibrated for a range of 0.775g/ml to 0.825g/ml @ 15°C for measuring the density of jet turbine fuels such as Jet A, Jet A1, JP4, JP7 and J98.

CONFORMANCE CERTIFICATE (WORKS)

SPECIFICATIONS

Range:	0.775 to 0.825g/ml
Reference Temperature:	15°C
Scale Sub-Division:	0.001g/ml
Accuracy:	± 0.0006g/ml
Length:	27cm
Bulb Diameter:	2.4cm

API GRAVITY HYDROMETERS – ASTM E100

12355/** API GRAVITY – ASTM E100 SERIES (LONG FORM) @ 60°F

ASTM D287; D1298; IP 160; API 2547; BS 4714 (obs); DIN 51 757; EN 3675; ISO 650; NF T60-101; JIS K2249-D

12356/** API GRAVITY – ASTM E100 SERIES (SHORT FORM) @ 60°F

ASTM D287

API GRAVITY HYDROMETER SELECTION CHART

Range (°API)	ASTM Ref (E100 Long)	Seta Part	Range (°API)	ASTM Ref (E100 Short)	Seta Part
-1 to 11	1H	12355/01	0 to 6	21H	12356/01
			5 to 11	22H	12356/02
9 to 21	2H	12355/02	10 to 16	23H	12356/03
			15 to 21	24H	12356/04
19 to 31	3H	12355/03	20 to 26	25H	12356/05
			25 to 31	26H	12356/06
29 to 41	4H	12355/04	30 to 36	27H	12356/07
			35 to 41	28H	12356/08
39 to 51	5H	12355/05	40 to 46	29H	12356/09
			45 to 51	30H	12356/10
49 to 61	6H	12355/06	50 to 56	31H	12356/11
			55 to 61	32H	12356/12
59 to 71	7H	12355/07	60 to 66	33H	12356/13
			65 to 71	34H	12356/14
69 to 81	8H	12355/08	70 to 76	35H	12356/15
			75 to 81	36H	12356/16
79 to 91	9H	12355/09	80 to 86	37H	12356/17
			85 to 91	38H	12356/18
89 to 101	10H	12355/10	90 to 96	39H	12356/19
			96 to 101	40H	12356/20

SPECIFICATIONS

Seta Series:	12355	12356
ASTM Series:	E100 (Long Form)	E100 (Short Form)
Reference Temperature:	60°F	60°F
Length:	33.5cm	16.8cm
Scale Sub-Division:	0.1°API	0.1°API
Accuracy:	± 0.1°API	± 0.1°API

CONFORMANCE OR CALIBRATION CERTIFICATES (WORKS OR UKAS) AVAILABLE. (SEE PAGE 131 FOR DETAILS)

API GRAVITY THERMO-HYDROMETERS – ASTM E100

12382/** API GRAVITY – ASTM E100 SERIES THERMO-HYDROMETERS 0° TO 150°F

12383/** API GRAVITY – ASTM E100 SERIES THERMO-HYDROMETERS 30° TO 180°F

12381/** API GRAVITY – ASTM E100 SERIES THERMO-HYDROMETERS 60° TO 220°F

ASTM D287

API GRAVITY THERMO-HYDROMETER SELECTION CHART

Range (°API)	0° to 150°F		30 ° to 180°F		60° to 220°F	
	ASTM Ref	Seta Part	ASTM Ref	Seta Part	ASTM Ref	Seta Part
-1 to 11	51HL	12382/01	51HM	12383/01	51HH	12381/01
9 to 21	52HL	12382/02	52HM	12383/02	52HH	12381/02
19 to 31	53HL	12382/03	53HM	12383/03	53HH	12381/03
29 to 41	54HL	12382/04	54HM	12383/04	54HH	12381/04
39 to 51	55HL	12382/05	55HM	12383/05	55HH	12381/05
49 to 61	56HL	12382/06	56HM	12383/06	56HH	12381/06
59 to 71	57HL	12382/07	57HM	12383/07	57HH	12381/07
69 to 81	58HL	12382/08	58HM	12383/08	58HH	12381/08
79 to 91	59HL	12382/09	59HM	12383/09	59HH	12381/09
89 to 101	60HL	12382/10	60HM	12383/10	60HH	12381/10

SPECIFICATIONS

Seta Series:	12381	12382	12383
Temperature Range:	60° to 220°F	0° to 150°F	30° to 180°F
ASTM Series:	E100	E100	E100
Reference Temperature:	60°F	60°F	60°F
Length:	38.7cm	38.7cm	38.7cm
Scale Sub-Division:	0.1°API	0.1°AP	0.1°API
Accuracy:	± 0.1°API	± 0.1°API	± 0.1°API

CONFORMANCE OR CALIBRATION CERTIFICATES (WORKS OR UKAS) AVAILABLE. (SEE PAGE 131 FOR DETAILS)

HYDROMETER JAR

12500-0 HYDROMETER JAR

Glass hydrometer reading jar with foot. Supplied in packs of 5.

SPECIFICATIONS

Size (H x Dia.):	47 x 6.3cm

HYDROMETER CYLINDER STAND

12700-0 HYDROMETER CYLINDER STAND (3 PLACE)

ASTM D1298; IP 160; API 2547

A bench top stand supplied with three jacketed glass hydrometer reading jars and interconnecting manifolds. Each jar has an integral PTFE drain valve. Suitable for use with a low temperature circulator for density determinations at 15°C.

SPECIFICATIONS	
Size (HxWxD):	78 x 30 x 33cm
Weight:	4.6kg

ACCESSORIES – Hydrometer Cylinder Stand

OPTIONAL

99300-2	MINI LOW TEMPERATURE BATH/CIRCULATOR, (*for details see page 139*).

DENSITY METER

12600-0 PORTABLE DENSITY MEASUREMENT KIT

- 0 to 1.999g/cm^3 range
- Single hand operation
- Density and SG measurements
- Explosion-proof - Ex II 2 G EEx ib IIC T5
- Petrol and organic solvent resistant
- Automatic temperature compensation
- Density standards included in the kit

IP PM DN: Determination of density of middle distillate fuels - Hand-held oscillating U-tube density meter method

A portable solution for rapidly determining the density, specific gravity or % concentration of samples, the Portable Density Measurement Kit comprises a handheld density meter, sampling probe and three density standards, all packed into a rugged carrying case. The density meter is intrinsically safe and ATEX certified as explosion-proof, making it suitable for use in the field.

The oscillating U Tube type density meter draws sample into the measurement chamber via a spring loaded plunger action pump. Alternatively, sample can be introduced by syringe through the supplied Luer adaptor. The internal seals are manufactured from Kalrez, and are resistant to attack from petrol and similar organic solvents.

Density measurements and temperature are shown on a large digit LCD display and can be stored/recalled from the on-board memory. The sample temperature is taken at the measuring cell, and compensation can be applied automatically.

Included with the kit are 100ml bottles of 0.8720 @20°C, 0.8540 @20C° and 0.8200 @20C° UKAS certified density standards, manufactured to ASTM D1840.

SUPPLIED WITH: filling tube, luer adaptor, density standards, case, instruction sheet.

12600-0

CONFORMANCE CERTIFICATE (UKAS) - DENSITY STANDARDS

CONFORMANCE CERTIFICATE (ATEX)

SPECIFICATIONS	
Density Range:	0 to 1.999g/cm^3
Temperature Range:	0 to 40°C (32 to 104°F)
Viscosity Range:	0 to 1000 mPa.s
Density Accuracy:	± 0.001g/cm^3
Temperature Accuracy:	± 0.1°C
Sample Volume:	2ml
Power Supply:	2 x 1.5V Alkaline batteries, type LR03 (AAA)
Size (H x W x D):	14 x 13 x 2.5cm
Weight:	0.5kg

CONSUMABLES – Portable Density Measurement Kit

2 Years/2000 Tests		Qty
12600-001	DENSITY STANDARD, 0.8720 @ 20°C, 100ml bottle	1
12600-002	DENSITY STANDARD, 0.8540 @ 20°C, 100ml bottle	1
12600-003	DENSITY STANDARD, 0.8200 @ 20°C, 100ml bottle	1

RELATIVE DENSITY

97300-0 SCHILLING EFFUSIOMETER

IP 59 Method C (obs)

An instrument providing a rapid and convenient method for determining the density of a gas relative to air.

Based on the assumption that the times taken by equal volumes of gases, under the same temperature and pressure, to flow through a small orifice are proportional to the square roots of the densities of the gases.

SUPPLIED WITH: instruction manual.

SPECIFICATIONS	
Size (HxWxD):	62 x 30 x 30cm
Weight:	4kg

CONSUMABLES - Schilling Effusiometer

2 Years/2000 Tests		Qty
97300-004	RUBBER RING, pack of 5	1
97300-005	GLASSWARE SEAL RING, pack of 5	1

97300-0

97320-0

ACCESSORIES - Schilling Effusiometer

OPTIONAL

97310-0	SETA TRANSIT CASE, lightweight with foam inserts, to receive Effusiometer, thermometer and spares.
97320-0	SETA METAL STAND, with carrying handle, to support Effusiometer when in use.

THERMOMETERS:

IP39F or IP39C

SPECIFIC GRAVITY

22100-0 SETA PRESSURE HYDROMETER APPARATUS

ASTM D1657 (obs); IP 59 Method C (obs); IP 235; ISO 3993; NF M41-008 (obs); JIS K2249

- 1400kPa (200 psi) max working pressure
- Operating temperature range -20 to 45°C
- Transparent cylinder pressure tested to 2800kPa (400psi)
- Steel safety mesh

For determining the density or specific gravity of light hydrocarbons including LP gases.

Comprises a polymethylmethacrylate pressure cylinder surrounded by a stainless steel mesh for maximum safety. A vapour vent-valve with tee-piece for a pressure gauge is mounted on the top. A buffer pad is incorporated for the hydrometer and a mounting clip for a thermometer. Inlet and outlet valves are mounted in the base and the instrument is connected to the LPG line via 1/4 BSP connections. A range of hydrometers and thermometers are available as accessories.

SUPPLIED WITH: instruction sheet.

PRESSURE CERTIFICATE (WORKS)

SETAPLUS EXTENDED WARRANTY AVAILABLE

22100-0 (Pressure Gauge supplied separately)

22101-4 with 22100-0 (supplied separately)

ACCESSORIES - Pressure Hydrometer App.

REQUIRED

Refer to the table of "ITEMS REQUIRED FOR EACH TEST" and select from the following options:

22580-2	SETA PRESSURE GAUGE, 0 to 2000 kPa (0 to 290 psi).
22680-0	HYDROMETER, 0.500 to 0.580 g/cm3 (for ISO and IP Methods).
22690-0	HYDROMETER, 0.570 to 0.650 g/cm3 (for ISO and IP Methods).
22730-0	THERMOMETER, ISO/R653, -15° to +45°C (for ISO 3993).
22720-0	THERMOMETER, BS 593 B60 C/Total, -20 to +60°C (for IP235).
22705-0	THERMO-HYDROMETER, ASTM310H, 0.500 - 0.650 specific gravity, thermometer -1.1°C to 32°C (for ASTM D1657).
22710-0	THERMO-HYDROMETER, ASTM101H, 0.500 - 0.650 specific gravity, thermometer 30°F to 90°F (for ASTM D1657).
	CERTIFICATION: UKAS CERTIFICATION OF PRESSURE GAUGES AND HYDROMETERS OPTIONAL
22101-4	HYDROMETER BATH AND COOLER, accepts 22100-0 pressure hydrometer apparatus as shown.
	Temperature Range: 0 to 100°C
	Voltage: 110/120V, 50/60Hz 220/240V, 50/60Hz
	Power: 1.4kW
	Size (HxWxD): 62 x 35 x 33cm
	Weight: 30kg (Bath) 28kg (Cooler)

OPTIONAL

45000-0	SETAPLUS EXTENDED 12 MONTH WARRANTY

ITEMS REQUIRED FOR EACH TEST

Seta No	D1657 (obs)	IP 59 (obs)	IP 235	ISO 3993
22580-2	●	●	●	●
22680-0		●	●	●
22690-0		●	●	●
22730-0				●
22720-0			●	
22705-0	●			
22710-0	●			

SPECIFICATIONS	
Max Working Pressure:	1400kPa (200psi)
Temperature Range:	-20 to 60°C
Size (HxWxD):	62 x 20 x 20cm
Weight:	4.2kg

CONSUMABLES - Pressure Hydrometer App.

2 Years/2000 Tests		Qty
22100-002	GASKET, pack of 10	1

AIR AND VACUUM PUMPS

14030-2 AIR PUMP

- Medium capacity
- Pressure or vacuum delivery
- For air and non-corrosive gases
- Oil Free
- Sintered air intake filter

SUPPLIED WITH: instruction manual.

SPECIFICATIONS	
Maximum Flow:	23 litres/min
Maximum Vacuum:	67kPa (9.7psi)
Maximum Pressure:	200kPa (29psi)
Power:	180W
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Size ((HxWxD):	19 x 23 x 15cm
Weight:	5kg

14030-2

14031-0 AIR PUMP

- High capacity
- Pressure or vacuum delivery
- For air and non-corrosive gases
- Oil Free
- Sintered air intake filter
- Pressure relief valve

SUPPLIED WITH: instruction manual.

SPECIFICATIONS	
Maximum Flow:	45 litres/min
Maximum Vacuum:	67kPa (9.7psi)
Maximum Pressure:	200kPa (29psi)
Power:	180W
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Size ((HxWxD):	19 x 29.5 x 15cm
Weight:	6kg

14031-0

20290-4 AIR PUMP

- Pressure or vacuum delivery
- Non-pulsating (rotary vane)
- For air and non-corrosive gases
- Oil Free
- Vacuum and pressure relief valve

SUPPLIED WITH: instruction manual.

SPECIFICATIONS	
Maximum Flow:	70 litres/min
Maximum Vacuum:	85kPa (12.3psi)
Maximum Pressure:	100kPa (14.5psi)
Power:	145W
Voltage:	220/240V, 50/60Hz
Size ((HxWxD):	12 x 16 x 21cm
Weight:	6.5kg

22422-6 VACUUM PUMP

- High vacuum
- Two stage
- Non-pulsating (rotary vane)
- Gas ballast valve
- Oil mist filter

SUPPLIED WITH: tubing, lubricating oil, oil mist filter and instruction manual.

SPECIFICATIONS	
Maximum Vacuum:	1 x 10^{-2} mbar
Maxuimum Flow:	42 litres/min
Power:	120W
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Size ((HxWxD):	30 x 40 x 25cm
Weight:	7kg

22422-6

80004-0 VACUUM PUMP

- High vacuum
- Two stage
- Direct Drive (sliding vane)
- Gas ballast valve
- Oil sealed

SUPPLIED WITH: instruction manual.

SPECIFICATIONS	
Maximum Vacuum:	1.5 x 10^{-3} mbar
Maxuimum Flow:	30 litres/min
Power:	160W
Voltage:	220/240V, 50/60Hz
Size ((HxWxD):	23 x 14 x 32cm
Weight:	10kg

80004-0

HEATING

99200-2 LABORATORY OVEN

- Temperature range ambient +5 to 220°C
- 53 litre capacity
- Fan for even temperature distribution
- 999 hour timer
- RS232 port
- Corrosion resistant stainless steel
- Calibrated

A digitally controlled oven suitable for heat storage, heat treatment and drying processes at temperatures up to 220°C for timed periods up to 999 hours.

The oven can be controlled from the front panel and integral timer, or by an IBM compatible personal computer (not supplied) connected to the RS232 port and using the supplied control/data logging software. An internal fan ensures even temperature distribution throughout the oven.

The internal working space is manufactured from corrosion resisting steel and has two moveable perforated stainless steel shelves.

SUPPLIED WITH: 2 shelves, software, and instruction manual.

SPECIFICATIONS	
Temperature Range:	Ambient +5 to 220°C
Internal Capacity:	53 litres
Power:	1.4KW
Voltage:	110/120V, 50,60Hz 220/240V, 50/60Hz
Size ((HxWxD):	37 x 37 x 32cm (internal) 57 x 42 x 44cm (external)
Weight:	35kg

SOFTWARE SUPPLIED

CALIBRATION CERTIFICATE (WORKS)

99200-2

99205-0 DESSICATOR

- 200 ml and Disc

25000-3 SETA-HOT

- 1000W Hot Plate

A general purpose laboratory electric hotplate. Comprises a 1000W heater element mounted in a stainless steel case with a 70mm diameter plate set into a heat resistant top plate. An integral energy regulator and rotary control allow fine temperature adjustment.

SUPPLIED WITH: mains lead and instructions.

SPECIFICATIONS	
Power:	1000W
Voltage:	110/120V, 50,60Hz 220/240V, 50/60Hz
Size ((HxWxD):	23 x 15 x 15cm
Weight:	2.7kg

25000-3

16130-3 SETA STEAM GENERATOR

- 14kPa (2psi) maximum steam pressure
- 5.25 litres useable capacity
- Compact lightweight unit

An electrically heated portable steam generator with a capacity of 7.12 litres (5.25 litres useable) with the output regulated to a maximum of 14kPa (2psi).

The die cast aluminium water tank is fitted with a water level sight tube and is protected by a pressure relief valve. The tank is tested to 140kPa (20psi). Over-temperature protection is via a resettable cutout that operates at a nominal 132°C and a thermal fuse that breaks at 184°C.

SUPPLIED WITH: mains lead and instructions.

PRESSURE CERTIFICATE (WORKS)

SPECIFICATIONS	
Tank Capacity:	7.12 litres (5.25 l useable)
Pressure Relief Valve:	0.14 to 40kpa (2 to 5.8psi)
Power:	825W
Voltage:	110/120V, 50,60Hz 220/240V, 50/60Hz
Size ((HxWxD):	28 x 22 x 40cm
Weight:	5.2kg

ACCESSORIES - Steam Generator	
OPTIONAL	
15650-0	WATER PURIFIER, to reduce lime scale. 60l/hr maximum flow, disposable cartridge.

16130-3

STIRRED LIQUID BATHS

15870-4 CIRCULATING WATER BATH

- Temperature range ambient to 120°C
- Integral stirrer
- Pump for external circulation
- Over-temperature protection
- Low liquid level protection
- 12 litre bath

Stainless steel thermostatic bath with built-in stirrer and pump to enable use as a circulator for external apparatus.

The bath temperature is digitally controlled to an accuracy of ±0.1°C across a temperature range of ambient to 120°C. The circulating pump has a maximum head of 310mbar at zero flow, and a maximum flow of 17 litres/min at zero head. The stirrer paddle is mounted in the centre of the helical heating element close to the pump inlet and temperature probe, ensuring an even heat distribution. The unit is equipped with over-temperature and low liquid level protection devices.

SUPPLIED WITH: mains lead and instruction manual.

SPECIFICATIONS	
Temperature Range:	Ambient to 120°C
Display Resolution:	0.1°C
Temperature Stability:	±0.1°C
Power:	1.4KW
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Size ((HxWxD):	35 x 35 x 33cm
Weight::	12.5kg

ACCESSORIES - Water Bath

OPTIONAL

15875-0	C&P TEST JAR HOLDER, holds 10 35mm tubes.

15870-4

15155-2 THERMOSTIR

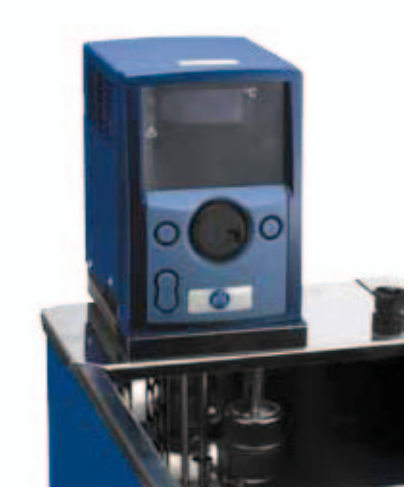
- Temperature range ambient +5°C to 100°C
- Integral stirrer
- Low liquid level protection

A general purpose thermostir which converts most vessels into a thermostatic bath, and features an integral stirrer to maintain a uniform temperature in the bath.

Temperature is digitally controlled to an accuracy of ±0.1°C across a temperature range of ambient to 99°C. The stirrer paddle is mounted in the centre of the helical heating element to promote even temperature distribution. The mounting clamp accommodates a maximum wall thickness of 20mm. The unit is equipped with a low liquid level protection device.

SUPPLIED WITH: mains lead and instruction manual.

SPECIFICATIONS	
Temperature Range:	Ambient +5°C to 100°C
Display Resolution:	0.1°C
Temperature Stability:	±0.1°C
Max. Circulation Capacity:	50 litres
Power:	1.5KW
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Size ((HxWxD):	30 x 10 x 17cm
Weight::	2.5kg



15155-2

BATH FLUIDS

- High flash point
- Low viscosity
- High transparency

Seta bath fluids are formulated to maximise the heat stability and efficiency of Seta baths.
The low viscosity reduces formation and aids dissipation of bubbles.

Seta Part No.	Temperature Range	Description	Quantity	Seta Part No.	Temperature Range	Description	Quantity
94630-0	40 to 80°C	BATH OIL	5 litres	94635-0	80 to 120°C	BATH OIL	20 litres
94633-0	40 to 80°C	BATH OIL	20 litres	94631-0	120 to 150°C	SILICONE BATH OIL	2 litres
94634-0	80 to 120°C	BATH OIL	5 litres	94632-0	120 to 150°C	SILICONE BATH OIL	20 litres

CRYOSTATS

94000-2 LOW TEMPERATURE BATH/CIRCULATOR

- Temperature range -47 to 100°C
- Stability ±0.1°C
- 1100W cooling power at 20°C
- Digital control
- Removeable top plate

A low temperature bath with digital control providing a convenient refrigerated liquid source for cooling test apparatus or for direct immersion of samples.

Consists of a refrigerated 12 litre stainless steel bath with integral thermostatic temperature controller, and a digitally controlled thermostir/pump unit, giving enhanced control and stability at temperatures between -47 and 100°C. The unit can dissipate 1100W at 20°C.

Fitted with a removeable top plate, and a socket for connection of a PT100 temperature probe.

SUPPLIED WITH: mains lead and instruction manual.

Note: Supplied excluding fittings.

SPECIFICATIONS	
Temperature range:	-47 to 100°C
Temperature stability:	0.1°C
Bath capacity:	12 litres
Flow rate:	17 litres/min (maximum)
Pressure:	31kPa (4.5psi)
Power:	2.4KW
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Size (HxWxD):	55 x 74 x 61cm
Weight:	54kg

94000-2

99300-2 MINI LOW TEMPERATURE BATH/CIRCULATOR

- Temperature range -20 to 100°C
- Stability ±0.1°C
- 250W cooling power at 20°C
- Digital control
- Removeable top plate

A small footprint low temperature bath suitable for providing a flow of chilled water for cooling applications, or for direct immersion of samples.

Comprises a 5 litre refrigerated stainless steel bath with thermostatic control, and a digitally controlled thermostir/pump unit. The unit can cool to -20°C and will dissipate 250W at 20°C. Safety features include over-temperature and anti-freezing protection.

SUPPLIED WITH: mains lead and instruction manual.

Note: Supplied excluding fittings.

SPECIFICATIONS	
Temperature range:	-20 to 100°C
Temperature stability:	0.1°C
Bath capacity:	5 litres
Flow rate:	17 litres/min (maximum)
Pressure:	31kPa (4.5psi)
Power:	1.8KW (maximum heat)
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Size (HxWxD):	41 x 41 x 23cm
Weight::	25kg

99300-2

34006-0 CRYOSTAT

- Temperature range -20 to 100°C
- Booster Pump for 9l/min flow

A small footprint low temperature bath with booster pump for increased flow of chilled water for external cooling applications.

Comprises a 99300-2 bath with a vertical turbine pump.

SUPPLIED WITH: mains lead and instruction manual.

Note: Supplied excluding fittings.

SPECIFICATIONS	
Temperature range:	-20 to 100°C
Temperature stability:	0.1°C
Bath capacity:	5 litres
Flow rate:	9 litres/min @ 100kPa
Pressure:	100kPa (14.5psi)
Power:	2.2KW (maximum heat)
Voltage:	110/120V, 50/60Hz 220/240V, 50/60Hz
Size (HxWxD):	41 x 41 x 23cm
Weight::	25kg

CO_2 DRY ICE MAKERS

Dry ice/liquid mixtures can produce temperatures down to -78°C. The latent heat of vaporization of dry ice is 572 kJ/kg (246 BTU per lb). Seta dry ice makers are a safe, efficient and convenient method of producing pellets and blocks in a range of sizes.

70200-0 SNOWPACK DRY ICE MAKER

- Makes 30g (1oz) pellet in one minute
- Fits directly to CO_2 syphon cylinder

SPECIFICATIONS	
Size ((HxWxD):	27 x 15 x 9cm
Weight::	0.6kg

70210-0

70210-0 SNOWPACK MAJOR DRY ICE MAKER

- Makes 500g (1lb) pellet in 2 ½ minutes
- Fits directly to CO_2 cylinder

SPECIFICATIONS	
Size ((HxWxD):	28 x 15 x 15cm
Weight::	0.8kg

70220-3 PORTABLE DRY ICE MAKER MODEL B

- Makes 1kg (2.2lb) block in one minute
- Fits directly to CO_2 cylinder

SUPPLIED WITH: pressure hose, and gauge.

SPECIFICATIONS	
Size ((HxWxD):	23 x 16 x 12cm
Weight::	3.3kg

70220-3 Main Unit and Hose/Gauge Assembly

REFRIGERATED STORAGE

93700-2 LABORATORY REFRIGERATOR

- Temperature range 0 to 10°C
- Cool storage of volatile materials
- CFC, HFC, HCFC free
- Spark resistant interior

For safe cooling and chilled storage of volatile products, 'spark resistant' refrigerators are essential.

The storage compartment can maintain temperatures in the range of 0 to 10°C, adjustable by a thermostat.

The refrigerator is equipped with two storage shelves and a lower drawer. The door seal is replaceable. To safeguard the integrity of samples, the refrigerator is fitted with a lockable door that can be converted to left or right opening.

SPECIFICATIONS	
Compartment Temp. Range:	0 to 10°C
Refrigerant:	R600a
Net Capacity:	115 litres
Power:	70W
Voltage:	220/240V, 50hz
Size (HxWxD):	85 x 50 x 56cm (external)
Weight::	20kg

93700-2

TIMERS

83750-3 SETATIME SIX-CHANNEL QUARTZ TIMER

- Precision timing and verification of timing devices
- Six independent channels

A quartz timer with six independent timing channels, each with a range of zero to 999.99 seconds.

Each channel has start/stop, hold and memory retrieval functions. A 9 way D type socket on the rear of the unit allows remote operation of all channels.

SUPPLIED WITH: mains lead and instruction manual.

OPTIONAL: CALIBRATION CERTIFICATE (UKAS)

SPECIFICATIONS	
Timing:	0 to 999.99 seconds
Accuracy:	±0.03 sec (between 10° and 60°C)
Functions:	Start/Stop, Display, Hold and Memory
Power Supply:	100/130V or 200/260V, 50/60Hz (switchable) or 12/15V dc
Size (HxWxD):	10 x 20 x 30cm
Weight:	2.6kg

83750-3

22750-2 DIGITAL STOPWATCH

- Precision timing
- Large LCD display
- Alarm

Hand held digital stopwatch with LCD display in water resistant case.

SUPPLIED WITH: battery and neckcord.

SPECIFICATIONS	
Timing:	24 hours in 0.1 second resolution
Functions:	Displays time/day/month with Audible alarm
Size (HxWxD)::	7 x 6 x 2cm

22750-2

BALANCES

99100-2 ANALYTICAL BALANCE

- Automatic zero
- Selectable units
- Anti vibration filter
- Glass windshield with 3 access doors
- RS232 port

Rugged electronic balance with wide angle LCD display. The balance is equipped with filters to reduce vibration, and a glass enclosure with sliding doors on three sides for ease of access. Features include automatic zeroing, selectable units and parts counting. Programmable filters. RS232 Interface.

SUPPLIED WITH: mains lead and instruction manual

CALIBRATION & VERIFICATION MATERIALS

SPECIFICATIONS	
Units of measurement:	g, mg, dwt, ct, oz, lb, GN, tl, t, m
Weighing capacity:	0 to 205gm
Readability:	0.1mg
Reproducibility:	0.1mg
Response time:	< 4 secs
Free space above pan:	200mm
Operating temp:	10° to 30°C
Size (HxWxD):	32 x 19 x 33cm
Weight:	7kg

ACCESSORIES - Analytical Balance

CALIBRATION, VERIFICATION & TRAINING

99110-0	CERTIFIED CALIBRATION WEIGHTS, 11 metric weights (*for details see page 147*).
99120-0	CERTIFIED CALIBRATION WEIGHTS, 12 fractional weights (*for details see page 147*).

99100-2

STIRRERS

24600-0 SETA UNIVERSAL STIRRER

- Variable speed - 100 to 2000 rev/min
- Overload protection
- Keyless chuck

A variable speed stirrer with a range of 100 to 2000rpm. The stirrer is designed for use with fluids having viscosities up to 10,000mPas, and develops a maximum torque to 15Ncm. An overload protection device limits the power to the motor in the event of excessive load on the stirrer.

The stirrer is equipped with a keyless chuck which can accommodate up to 13mm diameter shafts, and can be mounted on a standard 12.7mm retort stand.

SUPPLIED WITH: retort clamp and instructions.

SPECIFICATIONS	
Speed range:	100 to 2000 rev/min
Maximum torque:	15Ncm
Power:	50W
Voltage:	220/240V, 50/60Hz
Size (HxWxD):	23 x 8 x 24cm
Weight:	2kg

ACCESSORIES - Universal Stirrer

OPTIONAL

24500-0	STEEL STAND, with mast.
24630-0	FLEXIBLE DRIVE AND PULLEY, pack of 2.
24640-0	STIRRER ROTOR, stainless steel.
10200-004	STIRRER ROTOR, auger shaped glass rod, pack of 5.

24600-0

CLEANING BATH

99320-2 SETA ULTRASONIC CLEANING BATH

- Reduces water consumption
- Compact benchtop design
- Quiet and safe operation
- Robust and reliable

Ultrasonic cleaning is especially suitable for intricate/fragile objects such as glassware, metal instruments, sensors and similar items. The bath incorporates high power piezoelectric transducers to maximise washing efficiency, and is capable of cleaning heavy deposits such as D86 flask residual.

SUPPLIED WITH: cleaning basket and tank lid.

SPECIFICATIONS	
Bath capacity:	2 litres
Cleaning medium:	Mild alkaline detergent
Operating range:	20°C to 80°C
Timing:	0.1 to 99.9 mins
Power:	75W
Voltage:	220/240V, 50/60Hz 100/130V, 60Hz
Size (HxWxD):	25 x 17 x 16cm (external) 10 x 15 x 13.5cm (bath)
Weight:	2.5kg

99320-2

REMOTE PAGING / ALARM

00100-0 SETALERT REMOTE PAGING SYSTEM

- Visual and audible indication
- 6 channel rechargeable receiver
- Transmitter powered by the instrument or PC computer
- Each transmitter uniquely coded
- No licence required in UK
- Fits in pocket or can be belt worn

A 6 channel laboratory pocket radio paging system where the operator is notified by the instrument when a test has been completed or assistance is required. Setalert is compatible with the following Stanhope-Seta instruments:

34000-0 Multiflash

81000-2 Setavap 2

91600-3 Seta Multi Filtration Tester

SUPPLIED WITH: 1 transmitter module, receiver, and recharging unit

SPECIFICATIONS	
TRANSMITTER	
Operating frequency:	433MHz
Range:	300 metres maximum
Power Supply:	Powered from instrument/PC
Size (HxWxD):	3 x 5 x 7.5cm (antenna 17cm)
RECEIVER	
Alarm notification:	6 individual coloured LEDs and audio prompt
Power:	Rechargeable
Duration:	5 days per charge
Recharger Supply:	100 to 240V, 50/60Hz, universal
Size (HxWxD):	2 x 6.5 x 12cm (antenna 3.4cm)

ACCESSORIES - Setalert

OPTIONAL

00100-001	SETALERT TRANSMITTER, additional transmitter module (maximum 6 transmitters per receiver module)

00100-0

GLASSWARE

STANDARD GLASSWARE

If the method of test requires laboratory glassware items to be used in conjunction with an instrument in this catalogue, the glassware is listed in the relevant accessory box for the instrument.

The table to the right lists some of the more common methods of test and instruments that use laboratory glassware, and the section in which they are listed.

STANDARD GLASSWARE	
D86 Dean & Stark	Distillation *(for details see page 28)*
D2274 D943 D4310 DIN 51 587	Oxidation *(for details see page 64)* Corrosion & Rust *(for details see page 74)*
Quartz Tube Sulpur Apparatus Suplhur Lamp Apparatus	Particulates, Residues & Composition *(for details see page 80)*

SPECIALISED GLASSWARE

SETA can offer the following specialised glassware and apparatus.
If the glassware required is not listed, please contact Stanhope-Seta for a quotation.

SPECIALISED GLASSWARE		
Seta Part	**Method**	**Subject**
SG002	ASTM D70; D1481; D2111 IP 189/190 DIN 51 757; 52 004	Specific Gravity and Density of Liquid and Solid Petroleum Products
SG004	ASTM D1018	Hydrogen in Petroleum Fractions
SG006	ASTM D2420	Hydrogen in Sulphide LP Gases by Lead Acetate Method
SG008	ASTM D2569	Distillation of Pitch
SG010	ASTM D3242	Acidity in Aviation Turbine Fuel
SG012	ASTM D3712 IP 369	Analysis of Oil-Soluble Petroleum Sulfonates by Liquid Chromatology
SG014	IP 143 DIN 51 595	Determination of Asphaltenes
SG016	DIN 51 367; 51 368; 51 417 pt 1	Oil Content of Water Mixed Cooling Lubricants
SG018	DIN 51 589	Testing of Water Separation Ability
SG020	DIN 51 814	Mineral Oil Content and Soap of Lubricating Greases (Dialysis Method)

CALIBRATION AND VERIFICATION

The following precision instruments independently measure amd validate many of the critical parameters relevant to the test methods listed in this catalogue. These products are suitable for Calibration to National Standards and are supplied with Certificates of Calibration.

DENSITY

HYDROMETERS

Seta offer a large range of hydrometers suitable for use in test methods and for calibration purposes. Please refer to Section 20, Temperature & Fluid Density on pages 124-135.

It is recommended that hydrometers used at ambient temperatures should be recalibrated within 2 years of purchase and thereafter at intervals of 7 to 10 years. If a hydrometer is regularly used above ambient temperatures so that it is consistently heated and then cooled, as frequently occurs in the testing of fuel oils, it is a wise precaution to recalibrate the hydrometer annually. This will determine whether the thermal conditions of use are affecting the accuracy of the hydrometer.

Note: To avoid false accuracy, a hydrometer should always be checked to ensure that the paper scale has not moved. The datum line (a horizontal line shown above the graduations on the paper scale) must exactly align with a corresponding etch line marked into the glass stem.

CONFORMANCE CERTIFICATE (OPTIONAL: CALIBRATION CERTIFICATE UKAS)

TEMPERATURE

THERMOMETERS

Seta offer a large range of liquid-in-glass and digital thermometers suitable for use in test methods and for calibration purposes. Please refer to Section 20, Temperature & Fluid Density on pages 124-135.

The temperature corrections for mercury-in-glass thermometers may change over a period of time and as a general guide, it is considered desirable to re-test thermometers at intervals not exceeding 5 years. Kinematic Viscosity thermometers (and other types of a similar accuracy) should be re-tested more frequently.

Note: To avoid false accuracy, a thermometer should always be inspected before use to ensure that no gas has been trapped in the bulb or contraction chamber, and that there are no globules of separated mercury in the bore or expansion chamber above the column.

CONFORMANCE CERTIFICATE (OPTIONAL: CALIBRATION CERTIFICATE UKAS)

60005-002 DRY WELL PROBE CALIBRATOR

- Operating range 33 to 300°C
- Multiple diameter probe wells

A portable instrument designed to provide quick and accurate calibration of thermocouple and RTD temperature probes.

A precision temperature controlled oven heats an aluminium block drilled with various diameter holes to accept the probe being calibrated. The current temperature of the block and the set temperature are displayed on an LCD The temperature can be set to between 33 and 300°C in 0.1°C increments.

SUPPLIED WITH: mains lead and instruction manual.

CALIBRATION CERTIFICATE (UKAS)

SPECIFICATIONS	
Range:	33 to 300°C in 0.1°C increments
Accuracy:	33 to 100°C ±0.5°C 100 to 300°C ±1°C
Well Diameters	1/4, 3/16 (2off), 5/32, 1/8 and 1/16 inch
Power Supply:	115 VAC (±10%), 50/60Hz 230 VAC (±10%), 50/60Hz
Size (HxWxD):	5.7 x 12.5 x 15cm
Weight:	1kg

PRESSURE

99915-0 HANDHELD DIGITAL PRESSURE INDICATOR

- Verification and recalibration of pressure gauges, transducers and pressure transmitters.

A portable, battery operated precision pressure indicator in waterproof case to IP 54.

Pressure is displayed on a high resolution LCD and different units of measurement can be selected. The instrument has memory and peak hold facilities. An RS232 output allows information to be downloaded to a personal computer.

SUPPLIED WITH: dry cell batteries, soft carry case and instruction manual.

CALIBRATION CERTIFICATE (UKAS)

SPECIFICATIONS	
Range(s):	0 to 2000mbar
Accuracy:	±0.1% Full Scale
Units of Measurement:	16 user selectable Ambient temperature in °C or °F
Functions:	Ambient temperature, Leak test, Max/Min, Tare and audible alarm
Display:	LCD, 5 digit, 13mm
Power Supply:	3 x 1.5V AA Dry cell
Size (HxWxD):	19 x 9 x 3.6cm
Weight:	0.5kg

99915-0

99910-0 PORTABLE DIGITAL BAROMETER

- Calibration and cross-check of pressure or altimetric measuring instruments
- Accurate in-situ checks for barometric pressure and altitude

A portable, battery operated precision pressure indicator in waterproof case to IP 54.

Pressure is displayed on a high resolution LCD and different units of measurement can be selected to allow reading in pressure or height (barometric or altimetric) with memory and peak hold facilities.

An RS232 output allows information to be downloaded to a personal computer.

SUPPLIED WITH: dry cell batteries, mains adaptor, soft carry case, hard case, RS232 cable and instruction manual.

CALIBRATION CERTIFICATE (UKAS)

SPECIFICATIONS	
Range(s):	750 to 1150mbar (22 to 34 inHg) barometric
Accuracy:	±0.02% Full Scale
Units of Measurement:	24 user selectable Altitude in ft or m.
Functions:	Max/Min, Save, Tare, Filter, Altitude
Display:	LCD, 6 digit, 13mm
Power Supply:	3 x 1.5V AA Dry cell or rechargeable battery
Output:	RS232 via 6 way Lemo connector
Size (HxWxD):	19 x 9 x 3.6cm
Weight:	0.5kg (excluding transit case)

99910-0

14028-201 DIGITAL MANOMETER

- Calibration and cross-check of measuring instruments
- Accurate in-situ checks for vacuum and pressure performance

Portable, handheld instrument for calibration of gauges and apparatus. The large LCD screen shows readings in kPa or equivalent units of measurement can be selected.

SUPPLIED WITH: instrument wallet, battery and user instructions.

CALIBRATION CERTIFICATE (UKAS)

SPECIFICATIONS	
Range:	0 to100kPa
Accuracy:	±0.25% Full Scale
Power Supply:	9 volt PP3 battery (supplied)
Size (HxWxD):	14 x 7 x 2.5cm
Weight:	0.225kg

14028-201

PRESSURE

80005-2 PRESSURE CALIBRATOR

- 0.2 to 25bar
- Integral hand pump
- Weights included

An hydraulic dead weight tester with integral hand pump and pressure gauge.

Includes a set of calibrated weights and adaptors (to allow connection to different thread fittings).

SUPPLIED WITH: set of weights.

CALIBRATION CERTIFICATE (UKAS)

SPECIFICATIONS	
Range:	0.2 to 25 bar or equivalent
Accuracy:	±0.15% of indicated pressure
Size (HxWxD):	21 x 40 x 36cm
Weight:	17kg

VACUUM

80007-3 MCLEOD GAUGE

A McLeod gauge designed for measuring pressures of true gases in general laboratory use.

A free standing tilting gauge with a constant zero overflow and a graduated scale.

Note: Requires mercury charge (not included).

CALIBRATION CERTIFICATE (WORKS)

SPECIFICATIONS	
Range:	0.01 to 10 mm
Size (HxWxD):	28 x 38 x 33cm
Weight:	2.3kg

80008-0 DIGITAL VACUUM GAUGE

- Press-button pressure measurement
- Temperature compensated sensor
- Battery operated and handheld
- Datalogging function

No mercury, digital alternative to traditional McLeod gauges. The gauge is used in-line and has pressure units Mbar, Torr and pa.

SUPPLIED WITH: T-piece to allow in-line connection, and a 6 point calibration certificate.

CALIBRATION CERTIFICATE (UKAS)

SPECIFICATIONS	
Range:	100 mbar to 5 x 10^{-4} mbar
Operating Temperature:	5 - 50 deg C
Size (HxWxD):	12 x 6 x 2.5cm
Weight:	200g

80008-0

MASS & WEIGHT

99100-2 ANALYTICAL BALANCE

- Automatic zero
- Selectable units
- Anti vibration filter
- Glass windshield
- RS232 port

An electronic balance equipped with filters to reduce vibration, and a glass enclosure with sliding doors for draught free operation.

Features include automatic zeroing, selectable units, parts counting, programmable filters and an RS232 Interface.

SUPPLIED WITH: mains lead and instruction manual.

CALIBRATION CERTIFICATE (WORKS)

SPECIFICATIONS	
Units of mesurement:	g, mg, dwt, ct, oz, lb, GN, tl, t, m
Weighing capacity:	0 to 205gm
Readability:	0.1mg
Reproducibility:	0.1mg
Response time:	< 4 secs
Free space above pan:	200mm
Operating temp:	10° to 30°C
Size (HxWxD):	32 x 19 x 33cm
Weight:	7kg

99100-2

CERTIFIED CALIBRATION WEIGHTS

99110-0 GRAM CALIBRATION WEIGHT SET

- 1g to 200g
- Set of 11 weights

SUPPLIED WITH: storage case and pair of handling tweezers.

CALIBRATION CERTIFICATE (UKAS)

GRAM WEIGHT SET			
Weight	±mg	Material	Density (kg/dm^3)
1g	0.030	Stainless steel (non-magnetic)	8.0
2g (2x)	0.040	Stainless steel (non-magnetic)	8.0
5g	0.050	Stainless steel (non-magnetic)	8.0
10g	0.060	Stainless steel (non-magnetic)	8.0
20g (2x)	0.080	Stainless steel (non-magnetic)	8.0
50g	0.10	Stainless steel (non-magnetic)	8.0
100g	0.15	Stainless steel (non-magnetic)	8.0
200g (2x)	0.30	Stainless steel (non-magnetic)	8.0

99120-0 MILLIGRAM CALIBRATION WEIGHT SET

- 1mg to 500mg
- Set of 12 weights

SUPPLIED WITH: storage case and pair of handling tweezers.

CALIBRATION CERTIFICATE (UKAS)

FRACTIONAL WEIGHT SET			
Weight	±mg	Material	Density (kg/dm^3)
1mg	0.006	Aluminium	2.7
2mg (2x)	0.006	Aluiminium	2.7
5mg	0.006	Aluminium	2.7
10mg	0.008	Aluminium	2.7
20mg (2x)	0.010	Aluminium	2.7
50mg	0.012	Aluminium	2.7
100mg	0.015	Nickel-Silver	8.7
200mg (2x)	0.020	Nickel-Silver	8.7
500mg	0.025	Nickel-Silver	8.7

99120-0

ROTATION

99960-0 DIGITAL PHOTO TACHOMETER

- Verification of rotational speed

Hand held optical tachometer with quartz crystal micro-controller. Functions include min/max and memory functions. The LCD display shows speed as RPM, m/min or ft/min.

SUPPLIED WITH: carry case, reflecting tape and instruction manual.

CONFORMANCE CERTIFICATE OPTIONAL: CALIBRATION CERTIFICATE (UKAS)

SPECIFICATIONS	
Range:	5 to 9999 RPM (±0.05% + 1 digit)
Resolution:	±0.1% RPM (1 RPM above 1000)
Power Supply:	4 x AA size batteries (not supplied)
Size (HxWxD):	19 x 7 x 3.7cm
Weight:	250g

99960-0

TIME

83750-3 SETATIME SIX-CHANNEL QUARTZ TIMER

- Precision timing and verification of timing devices
- Six independent channels

A quartz timer with six independent timing channels, each with a range of zero to 999.99 seconds.

Each channel has start/stop, hold and memory retrieval functions. A 9 way D type socket on the rear of the unit allows remote operation of all channels.

SUPPLIED WITH: mains lead and instruction manual.

OPTIONAL: CALIBRATION CERTIFICATE (UKAS)

SPECIFICATIONS	
Timing:	0 to 999.99 seconds
Accuracy:	±0.03 sec (between 10° and 60°C)
Functions:	Start/Stop, Display, Hold and Memory
Power Supply:	100/130V or 200/260V, 50/60Hz (switchable) or 12/15V dc
Size (HxWxD):	10 x 20 x 30cm
Weight:	2.6kg

83750-3

22750-2 DIGITAL STOPWATCH

- Precision timing
- Large LCD display
- Alarm

Hand held digital stopwatch with LCD display in water resistant case.

SUPPLIED WITH: battery and neckcord.

SPECIFICATIONS	
Timing:	24 hours in 0.1 second resolution
Functions:	Displays time/day/month with Audible alarm
Size (HxWxD)::	7 x 6 x 2cm

22750-2

FLOW

99965-0 PORTABLE FLOWMETER

- 0 to 200ml/min
- ±1.5% accuracy
- Oxygen or air
- Tilting display

An in-line flow meter with an advanced straight sensor tube and restrictor flow element to give a high degree of accuracy. Pre-calibrated for air at an inlet pressure of 5 to 60 psi, with a gas temperature between 15 and 20°C.

SUPPLIED WITH: 240V power supply.

CALIBRATION CERTIFICATE (WORKS)

SPECIFICATIONS	
Range:	0-200ml/min
Accuracy:	1.5% FS
Couplings:	1/4 inch compression
Size (HxWxD):	15 x 12.5 x 2.5cm

99965-0

FOAM BATH CALIBRATION EQUIPMENT

14028-4 VERIFICATION FOAM KIT

ASTM D892; D6082; IP 146 Appendix XI; ISO 6247; NF T60-129; JIS K2518

- Maximum pore diameter verification
- Permeability verification
- Suitable for Mott Diffusers and Norton Stones
- For use with Seta 14020-5 and 14025-0 Foam Baths

An apparatus to quickly verify the maximum pore diameter and permeability of Mott diffusers and Norton stones used in foam baths.

Comprising an air pump, a test selector valve, porosity air control regulator, permeability air control regulator, glassware, digital manometer and a flowmeter, all mounted on a chassis with the necessary manifolds and interconnecting tubes.

SUPPLIED WITH: air pump, glassware, manometer, flowmeter, all necessary tubing, mains lead and instruction manual.

ACCESSORIES - Verification - Foam

REQUIRED

22750-2	DIGITAL STOPWATCH, hand-held, 0.1s resolution *(for details, see page 141).*

CONSUMABLES - Verification Foam

2 Years/2000 Tests		Qty
14028-202	FLASK, 250ml, glass	1
14028-203	CYLINDER, 250ml, glass	1
16720-002	SILICONE RUBBER TUBE, 5m	1

SPECIFICATIONS

Voltage:	110/120V, 60Hz 220/230V, 50/60Hz
Power:	300W
Size (HxWxD):	60 x 45 x 28cm
Weight:	8.6kg

14028-4 (Mott Diffuser not supplied)

CALIBRATION CERTIFICATE (UKAS) - MANOMETER & FLOWMETER

EXISTENT GUM CALIBRATION EQUIPMENT

12250-0 SETA CALIBRATED AIR FLOW METER

- Suitable for Seta Existent Gum Solid Block Baths 12200-0, 12200-2 and 12200-3
- <1kPa back pressure

A precision flow meter for calibrating and verifying the air flow in accordance with the methods of test. Graduated and calibrated at 510, 600, and 690 ml/s.

SUPPLIED WITH: instruction manual.

SPECIFICATIONS

Size (HxWxD):	57 x 14 x 17cm
Weight:	2.3kg

CALIBRATION CERTIFICATE (WORKS)

12255-0 SETA STEAM CALIBRATION KIT

- Suitable for Seta Existent Gum Solid Block Baths 12200-0, 12200-2 and 12200-3

Connects to the bath jet assemblies to calibrate/verify the flow and volume of steam in accordance with the methods of test.

SUPPLIED WITH: graduated 2 litre measuring cylinder.

FOUR BALL LOAD CALIBRATION EQUIPMENT

19930-0 SETA LOAD VERIFICATION KIT

- Suitable for use with Four Ball Lubricant Tester 19900-2
- Direct measurement of load in test cell

A load cell fits in place of the plunger assembly/test cell in Seta Four Ball Lubricant Testers, and displays the actual load applied on an LCD display.

SUPPLIED WITH: load cell, meter, interconnection leads, mains lead and instruction manual.

CALIBRATION CERTIFICATE (WORKS)

PENETRATION

17150-0 SETA PENETROMETER CALIBRATION KIT

- Verifies the calibration (depth of movement) of Penetrometers

Comprises set of precision ground dimension gauges. Supplied in protective box.

CALIBRATION CERTIFICATE (UKAS)

MULTI-TEST VERIFICATION MATERIALS

- A highly cost effective solution to laboratory verification requirements
- Verification to ASTM/CEN/ISO/IP and equivalent test procedures
- Cross-checks instrument performance using real product
- Assistance for operator training

Incorrect determination of a result can have far reaching financial and safety implications. The growing use of automated instrumentation increases the possibility that incorrect results may go undetected and in addition the early indication of bias is a useful warning to minimise production 'giveaway'.

Multi Test Verification Materials (MTVM) allow routine monitoring of instrument performance and are also particularly helpful in training personnel on new equipment and test methods. We recommend the purchase of MTVM's with new instrumentation to assist with installation and commissioning.

Seta MTVMs are unique because, unlike most other certified reference materials that are only suitable for validating a specific parameter/value, our MTVMs enable a user to validate different tests and instrumentation using the same sample material.

MTVMs are blended by a major multi-national refining company in conformance with ISO 9001 and ISO/IEC/EN 17025 (ISO Guide 25 and EN 45001) and tested internationally by a statistically significant number of laboratories to determine certified values.

Seta MTVMs are supplied in 500ml containers (except 99856-0 which is 250ml) and have an 18 month validity from date of supply.

Note: Each MTVM sample provides a single value for all of the latest parameters shown in the tables. The actual value of each test will fall within the range shown.

CERTIFICATE OF MEASUREMENT (WORKS) FOR ALL TEST METHODS COVERED BY THE MATERIAL

TECHNICAL DATASHEETS AVAILABLE

99850-0 SETA MTVM - KEROSINE (JET TURBINE FUEL) 500ML

Test Name	ASTM / Method	Range	Amount/test
Distillation IBP	D86-IP 123; EN ISO 3405	140 to 180°C	100ml
Distillation 10%	D86-IP 123; EN ISO 3405	159 to 188°C	100ml
Distillation 50%	D86-IP 123; EN ISO 3405	183 to 218°C	100ml
Distillation 90%	D86-IP 123; EN ISO 3405	220 to 247°C	100ml
Distillation FBP	D86-IP 123; EN ISO 3405	244 to 268°C	100ml
Distillation Residue	D86-IP 123; EN ISO 3405	1.1 to 1.3 %vol	100ml
Distillation Loss	D86-IP 123; EN ISO 3405	0.4 to 0.8 %vol	100ml
Flash Point	IP 170; EN ISO 13736	35 to 60°C	85ml
Freezing Point	D2386-IP 16	-62 to -44°C	25ml
Aromatics FIA	D1319-IP 156	16 to 22 %vol	0.75ml
Smoke Point	D1322-IP 57; ISO 1322	20 to 25mm	20ml
Kin Vis -20°C	D445-IP 71; EN ISO 3104	2 to 8mm^2/s	20ml
Acid Number	D3242-IP 354	< 0.100mg KOH/g	100ml
Mercaptans	D3227-IP 342; ISO 3012	0.0001 to 0.0100%(m/m)	40ml

99851-0 SETA MTVM - GAS OIL 500ML

Test Name	ASTM / Method	Range	Amount/test
Distillation at 15°C	D1298-IP 160; EN ISO 3675	0.83 to 0.854kg/l	Up to 200ml
Distillation IBP	D86-IP 123; EN ISO 3405	160 to 190°C	100ml
Distillation 10%	D86-IP 123; EN ISO 3405	200 to 242°C	100ml
Distillation 50%	D86-IP 123; EN ISO 3405	260 to 290°C	100ml
Distillation 90%	D86-IP 123; EN ISO 3405	320 to 350°C	100ml
Distillation 95%	D86-IP 123; EN ISO 3405	335 to 368°C	100ml
Distillation FBP	D86-IP 123; EN ISO 3405	350 to 385°C	100ml
Distillation Residue	D86-IP 123; EN ISO 3405	1.25 to 1.42 %vol	100ml
Distillation Loss	D86-IP 123; EN ISO 3405	0.26 to 0.7 %vol	100ml
Flash Point	D93-IP 34; EN ISO 2719	56 to 80°C	75ml
Cloud Point	D2500; D5771-IP 444; D5772-IP 445; D5773-IP 446; IP 219; ISO 3015; EN 23015	-17 to -4°C	Up to 38ml
CFPP	D6371; IP 309; EN 1166	-30 to 0°C	45ml
Pour Point	D97-IP 15; D5950; D5949; D6749; D6892; D5985; EN ISO 3016	-33 to -6°C	Up to 38ml
Kin Vis 40°C	D445-IP 71; EN ISO 3104	2.3 to 3.5mm^2/s	Up tp 40ml
Lubricity HFRR	D6079; IP 450; ISO 12156-1	271 to 512µm	2ml
Water Karl Fischer	D1744; IP 438; EN ISO 12937	23.4 to 63.9mg/kg	5ml

MULTI-TEST VERIFICATION MATERIALS

99854-0 SETA MTVM - MOTOR GASOLINE 500ML

Test Name	ASTM / Method	Range	Amount/test
Motor Octane No.	D2700; ISO 5163	83 to 90 MON	-
Research Octane No.	D2699; ISO 5164	95 to 101 RON	-
Density at 15°C	D1298-IP 160; EN ISO 3675	0.721 to 0.763kg/l	Up to 200ml
Distillation IBP	D86-IP 123; EN ISO 3405	28 to 39°C	100ml
Distillation 70°C	D86-IP 123; EN ISO 3405	15 to 36 %vol	100ml
Distillation 100°C	D86-IP 123; EN ISO 3405	36 to 58 %vol	100ml
Distillation 150°C	D86-IP 123; EN ISO 3405	75 to 93 %vol	100ml
Distillation FBP	D86-IP 123; EN ISO 3405	175 to 205°C	100ml
Aromatics FIA	D1319; IP 156	19 to 42 %vol	0.75ml
Olefins FIA	D1319; IP 156	1.5 to 15 %vol	0.75ml
Saturates FIA	D1319; IP 156	42 to 72 %vol	0.75ml
Vapour Pressure	D5191; IP 394; EN 13016-1	50 to 87kPa	3ml

99852-0 SETA MTVM - FUEL OIL 500ML

Test Name	ASTM / Method	Range	Amount/test
Density at 15°C	D1298-IP 160; EN ISO 3675	0.94 to 0.994 kg/l	200ml
Pour Point	D97-IP 15; D5985; D5950; D5949; D6749; D6892; EN ISO 3016	-14 to 7°C	Up to 38ml
Kin Vis 50°C	D445-IP 71; EN ISO 3104	150 to 1800mm^2/s	Up to 40ml
Kin Vis 100°C	D445-IP 71; EN ISO 3104	20 to 95mm^2/s	Up to 40ml
Micro Carbon	D4530; IP 398; ISO 10370	0.10 to 30.0 %(m/m)	2ml
Flash Point	D93 (b) - IP 34 (b); EN ISO 2719 (b)	92.3 to 121.6°C	75ml

99853-0 SETA MTVM - LUBRICATING OIL 500ML

Test Name	ASTM / Method	Range	Amount/test
Kin Vis 40°C	D445-IP 71; EN ISO 3104	70 to 160 mm^2/s	Up to 40ml
Kin Vis 100°C	D445-IP 71; EN ISO 3104	10 to 19 mm^2/s	Up to 40ml
Viscosity Index	D2270-IP 226; ISO 2909	139 to 180	Up to 80ml
Pour Point	D97-IP 15; D5985; D5950; D5949; D6749; D6892; EN ISO 3016	-49.1 to -33°C	Up to 38ml
Flash Point	D93-IP 34; EN ISO 2719	196 to 213°C	75ml

99856-0 SETA MTVM - BITUMEN 250ML

Test Name	ASTM/Method	Range	Amount/test
Softening Point	IP 58; EN ISO 1427	37 to 54°C	7.5ml
Needle Penetration	IP 49; EN ISO 1426	41 to 200 Pen	130ml

99908-0 SETA BIO MTVM - GAS OIL 500ML

- ULSD EN 590 Biofuel
- 5% FAME (EN 14214) in Diesel

BIO-FUEL TESTING

Test Name	ASTM/Method	Sample Result	Amount/test
Distillation at 15°C	D1298-IP 160	0.8404kg/l	Up to 200ml
Distillation IBP	D86-IP 123	173.6°C	100ml
Distillation 10%	D86-IP 123	204.7°C	100ml
Distillation 50%	D86-IP 123	260.7°C	100ml
Distillation 90%	D86-IP 123	327.2°C	100ml
Distillation 95%	D86-IP 123	346.2°C	100ml
Distillation FBP	D86-IP 123	358.1°C	100ml
Distillation Residue	D86-IP 123	1.3 %vol	100ml
Distillation Loss	D86-IP 123	0.6 %vol	100ml
Flash Point	D93-IP 34	66.6°C	75ml
Cloud Point	D2500-IP 219	-6.3°C	Up to 38ml
CFPP	IP 309	-19.7°C	45ml
Pour Point	D97-IP 15	-28.3°C	Up to 38ml
Kin Vis 40°C	D445-IP 71	2.567mm^2/s	Up tp 40ml
Lubricity HFRR	D6079; IP 450	207.1µm	2ml
Water Karl Fischer	D1744; IP 438	60.138mg/kg	5ml

SINGLE-TEST VERIFICATION MATERIALS

- Single test verification
- Fully traceable in conformance with ASTM/CEN/ISO/IP guidelines
- Small pack size 50ml containers

Single Test Verification Materials (STVM) enable individual tests and instruments to be validated. The volume of verification material in each container has been chosen to ensure that there is little wastage after completion of verification tests, and reducing the risk of using a verification material that has been accidentally contaminated by another user. STVMs allow highly accurate monitoring of instrument performance and operator technique.

STVMs are blended by a major multi-national refining company in conformance with ISO 9001 and ISO/IEC/EN 17025 (ISO Guide 25 and EN 45001) and tested internationally by a statistically significant number of laboratories to determine certified values.

Seta STVMs have an 18 month validity from date of supply.

Note: The approximate ranges given in the following tables are for guidance only in choosing an appropriate STVM. When ordering, please quote the Test Name.

CERTIFICATE OF MEASUREMENT (WORKS) FOR THE SPECIFIED TEST METHOD

TECHNICAL DATASHEETS AVAILABLE

SETA STVM – KEROSINE 50ML

Seta Part No.	Test Name	ASTM/Method	Range
99857-0	Napthalenes	D1840	1.33 to 2.4 %vol
99858-0	Sulfur ED X-ray	D4294-IP 336; EN ISO 8754	0.003 to 0.07 %m/m
99898-0	Aromatics-Di HPLC	D6379-IP 436	1.44 to 2.82 %m/m
99898-0	Aromatics-Mono HPLC	D6379-IP 436	15.2 to 21.2 %m/m
99898-0	Aromatics-Total HPLC	D6379-IP 436	16.9 to 22.8 %m/m

SETA STVM – GAS OIL 50ML

Seta Part No.	Test Name	ASTM/Method	Range
99859-0	Sulfur ED X-ray	D4294-IP 336; EN ISO 8754	0.003 to 0.016 %m/m
99867-0	Sulfur WD X-ray	D2622	0.0009 to 0.013 %mm
99869-0	Aromatics HPLC	D6591-IP 391; EN 12916	0.6 to 3.6 %m/m

SETA STVM – FUEL OIL 50ML

Seta Part No.	Test Name	ASTM/Method	Range
99860-0	Vanadium	IP 288 (obs)	16 to 140µg/g
99860-0	Nickel	IP 288 (obs)	7 to 45µg/g
99862-0	Sulfur ED X-ray	D4294-IP 336; EN ISO 8754	0.981 to 2.572 %m/m
99866-0	Sulfur WD X-ray	D2622	0.9709 to 2.578 %m/m

SETA STVM – LUBE OIL 50ML

Seta Part No.	Test Name	ASTM/Method	Range
99863-0	Calcium	ICP	0.18 to 0.35 %m/m
99863-0	Zinc	ICP	0.09 to 0.15 %m/m
99863-0	Phosphorus	ICP	0.08 to 0.16 %m/m

SETA STVM – GASOLINE 5 X 5ML

Seta Part No.	Test Name	ASTM/Method	Range
99865-0	Benzene	D3606; EN 12177	0.4 to 0.9 %vol
99868-0	Sulfur UVF	D5453; IP 490; EN ISO 20846	2.2 to 129mg/kg

SINGLE-TEST VERIFICATION MATERIALS

SETA BIO STVM - BIODIESEL 50ML

- ULSD EN590 Biofuel
- 5% FAME (EN 14214) in Diesel

BIO-FUEL TESTING

Seta Part No.	Test Name	ASTM/Method	Range
99902-0	Sulfur ED X-Ray	D4294-IP 336; EN ISO 8754	Sample Result 0.003
99903-0	Sulfur WD X-Ray	D2622	Sample Result 0.0025
99904-0	Aromatics HPLC	D6591-IP 391; EN 12916	Sample Result 3.4

Note: The approximate ranges given in the table above are for guidance only in choosing an appropriate STVM. When ordering, please quote the Test Name.

99905-0 SETA SIMDIS STVM - KEROSINE (JET TURBINE FUEL)10ML

Test Name	ASTM/Method	Range	Amount/Test
SIMDIS IBP	D2887-IP 406	100 to 180°C	1ml
SIMDIS 10%	D2887-IP 406	142 to 188°C	1ml
SIMDIS 50%	D2887-IP 406	183 to 218°C	1ml
SIMDIS 90%	D2887-IP 406	220 to 249°C	1ml
SIMDIS 95%	D2887-IP 406	230 to 259°C	1ml
SIMDIS FBP	D2887-IP 406	244 to 297°C	1ml

99906-0 SETA SIMDIS STVM - GAS OIL 10ML

Test Name	ASTM/Method	Range	Amount/Test
SIMDIS IBP	D2887-IP 406	120 to 190°C	1ml
SIMDIS 10%	D2887-IP 406	177 to 242°C	1ml
SIMDIS 50%	D2887-IP 406	260 to 290°C	1ml
SIMDIS 90%	D2887-IP 406	320 to 354°C	1ml
SIMDIS 95%	D2887-IP 406	335 to 369°C	1ml
SIMDIS FBP	D2887-IP 406	350 to 414°C	1ml

VISCOSITY STANDARDS

- Full compliance to ASTM, IP & other method protocols
- Manufactured under ISO 17025 quality standards
- UKAS Certified
- Supplied in 500 ml containers
- Tamper evident packaging for security and proof of integrity
- Valid for 2 years

Viscosity standards supplied by Seta are exactly equivalent to, and interchangeable with other recognised viscosity standards that adopt the reference numbers shown in the product table listed below, as specified in many international test methods and often referred to for calibration requirements.

Seta supplied viscosity standards are manufactured in full compliance with ASTM D2162.

Note: The viscosity values in the following table are approximate and are for guidance in choosing the appropriate standard only. The actual values will be indicated on the container.

CALIBRATION CERTIFICATE (UKAS)

GENERAL PURPOSE VISCOSITY STANDARDS

KINEMATIC VISCOSITY mm²/S (cSt)											SAYBOLT VISCOSITY		
Standard Ref No	Seta Part No.	20.00°C 68.00°F	25.00°C 77.00°F	37.78°C 100.00°F	40.00°C 104.00°F	50.00°C 122.00°F	60.00°C 140.00°F	80.00°C 176.00°F	98.89°C 210.00°F	100.00°C 212.00°F	SUS 100.00°F	SFS 210.00°F	SFS 122.00°F
S3	99784-0	4.6	4.1	3.1	2.9	2.4	2.1	1.5	1.2	1.2			
D5	99830-0	7.1	6.1		4.1	3.3				1.5			
S6	99785-0	10	8.8	6	5.7	4.5	3.6	2.5	1.9	1.9			
D10	99831-0	15	12	8.2	7.7	5.9	4.6	3.1	2.3	2.3			
N10	99771-0	21	17	11	10	7.4	5.7	3.7	2.7	2.6			
S20	99786-0	44	34	20	18	13	9.4	5.7	3.9	3.8	97		
N35	99832-0	85	65	36	32	22	16	8.8	5.7	5.6	155		
S60	99787-0	161	119	60	54	35	24	13	7.9	7.7	280		
N100	99833-0	324	234	113	100	62	41	21	12	12	522		
S200	99788-0	649	456	205	181	107	68	32	18	17	950	90	
D500	99834-0	830	579		224	131		38		20			
N350	99835-0	1 235	851	366	320	184	113	50	27	26	1693	131	
D1000	99836-0	1 696	1 159		423	239				32			
S600	99789-0	2 146	1 455	598	520	290	173	73	38	37		180	137
N1000	99837-0	4 490	2 981	1165	1 004	538	309	122	61	59			
S2000	99790-0	7 946	5 222	1 983	1 700	890	499	189	90	87			
D5000	99838-0	8 626	5 644		1 818	945				90			
D7500	99839-0	13 383	8 702	3207	2 735	1 397	766			122			
N4000	99840-0	17 966	11 627	4216	3589	1 811	9981	346	155	149			
S8000	99791-0	35 264	22 566	7 981	6 748	3 327	1760	589	253	241			
N15000	99841-0	70 582	44 855	15541	13 087	6 342	3 289	1 054	434	413			
S3000	99792-0		79 747	27 285	22 946	10993	5623	1 756	700	667			

LOW TEMPERATURE VISCOSITY STANDARDS

DYNAMIC VISCOSITY mPa s (cP)																			
Standard Ref No	Seta Part No.	-40°C -40°F	-34.44°C -30°F	-28.89°C -20°F	-27°C -16.6°F	26.5°C -15.7°F	-26.11°C -15°F	-26°C -14.8°F	-25.5°C -13.9°F	-25°C -13°F	23.33°C -10°F	-17.78°C 0°F	-13°C 8.6°F	-12.5°C 9.5°F	-12.22°C 10°F	-12°C 10.4°F	-11.5°C 11.3°F	-11°C 12.2°F	-6.67°C 20°F
N27B	99793-0	37 449	13 281	5 313			3 504				2 360	1 145							
N115B	99794-0			142 782			95 380				65 157	32 353			17 108				9 533
N480B	99720-0				184 000	164 400	152 500	148 400	133 600	120 400									
N1400B	99722-0												179 400	164 300	156 500	151 200	137 600	126 100	

JET FUEL (JF1) VISCOSITY STANDARD

KINEMATIC VISCOSITY mm²/S (cSt)		
Seta Part No.	Standard Ref No	-20°C -4°F
99798-0	JF1	3.7

VISCOSITY STANDARDS

SETAVIS VISCOSITY STANDARDS

Setavis KAV Duplex Tubes should be individually verified or calibrated at the intended test temperature and nearest flow time, using certified viscosity standards. For calibration two standards are required for each tube to provide at least 50% difference in flow time as required by ASTM D446.

VISCOMETER TUBES		40°C RANGE STANDARDS				100°C RANGE STANDARDS			
		First Standard		Second Standard		First Standard		Second Standard	
Seta Part No.	Nominal Tube Constant	Seta Part No.	Nominal Viscosity (mm^2/s)	Seta Part No.	Nominal Viscosity (mm^2/s)	Seta Part No.	Nominal Viscosity (mm^2/s)	Seta Part No.	Nominal Viscosity (mm^2/s)
83605-003	0.05	99784-0	2.9	99785-0	5.7	99786-0	3.9	99787-0	7.5
83605-004	0.1	99831-0	7.5	99786-0	18	99787-0	7.5	99833-0	13
83605-005	0.3	99786-0	18	99832-0	29	99834-0	21	99789-0	36
83605-006	0.5	99832-0	29	99787-0	54	99789-0	36	99837-0	57
83605-007	1	99833-0	114	99788-0	181	99790-0	83	99840-0	137
83605-008	3	99788-0	181	99835-0	324	99791-0	242	99841-0	406
83605-009	5	99835-0	324	99789-0	518	99841-0	406	99792-0	628

COLOUR REFERENCE STANDARDS

- High stability
- Certified to UKAS/ISO
- 500ml bottle

Suitable for routine calibration of instruments, and verification of test results. The highly colour stable standards are also suitable for instrument and laboratory correlation. Each colour reference standard is packaged in a 500ml bottle, and has a shelf life of 12 months (6 months for Pt-Co standards).

CONFORMANCE CERTIFICATE (ISO 9001) OR
CALIBRATION CERTIFICATE (UKAS) - SEE TABLE

ASTM COLOUR REFERENCE STANDARDS

ASTM D1500; D6045		
Seta Part Number	**Certified Value (nom)**	**Certification**
15370-0	<0.5	UKAS to ISO 17025
15371-0	1	UKAS to ISO 17025
15372-0	3	UKAS to ISO 17025
15373-0	5	UKAS to ISO 17025

PLATINUM-COBALT COLOUR REFERENCE STANDARDS

ASTM D1209		
Seta Part Number	**Certified Value (nom)**	**Certification**
15380-0	5	ISO 9001
15381-0	10	ISO 9001
15382-0	15	ISO 9001
15383-0	30	ISO 9001
15384-0	50	ISO 9001
15385-0	100	ISO 9001

SAYBOLT COLOUR REFERENCE STANDARDS

ASTM D156; D6045 (Range of 0 to 30 only)		
Seta Part Number	**Certified Value (nom)**	**Certification**
15386-0	-10	UKAS to ISO 17025
15387-0	0	UKAS to ISO 17025
15388-0	12	UKAS to ISO 17025
15389-0	25	UKAS to ISO 17025

GARDNER COLOUR REFERENCE STANDARDS

ASTM D1544; D6166		
Seta Part Number	**Certified Value (nom)**	**Certification**
15374-0	2	UKAS to ISO 17025
15375-0	5	UKAS to ISO 17025
15376-0	8	UKAS to ISO 17025

CERTIFIED FLASH POINT MATERIALS

99878-3 SMALL SCALE CERTIFIED FLASH POINT MATERIAL

ASTM D3278; D3828; D7236; IP 523; IP 524; IP 534; ISO 3679; ISO 3680; BS 3900 Part A13; UN Class 3 Non-viscous Flammable Liquids

- 74°C flash point (nominal)
- Supplied in 50ml containers

Setaflash certified flash point materials are suitable for Closed Cup test methods and are manufactured in accordance with ISO Guides 34 and 35.

Reproducibility is in accordance with ISO 4259. Nominal certified flash point value 74°C (uncertainty 0.3°C).

Supplied in 50ml bottles.

CERTIFICATE OF MEASUREMENT (WORKS)

FLASH POINT VERIFICATION STANDARDS

99880-0 SETA FLASHCHECK

- Cleveland (ASTM D92) 86°C flash point (nominal)
- Pensky-Martens (ASTM D93) 75°C flash point (nominal)
- TAG (ASTM D56) 74°C flash point (nominal)
- TAG Open Cup (ASTM D1310) 82°C flash point (nominal)
- Supplied in 80ml containers (pack of 3)

Flashcheck is a highly cost effective and non-hazardous Secondary Working Standard suitable for verification of ASTM, CEN, ISO, IP and equivalent flash point testing procedures.

Flashcheck provides rapid validation of test results and verification of inter-company cross-check schemes; it is also a useful material for operator training and checking instrument performance.

CERTIFICATE OF MEASUREMENT (WORKS) FOR ALL 4 TEST METHODS

TECHNICAL DATASHEETS AVAILABLE

99882-0 CLEVELAND STANDARD (3 PACK)

99883-0 CLEVELAND STANDARD (6 PACK)

99884-0 CLEVELAND STANDARD (12 PACK)

- Fully traceable to National Standards
- Tested and certified in accordance with ASTM D92/IP 36
- 258°C nominal value
- Supplied in 80ml bottles

Designed specifically for use in determining flash points in petroleum products by the Cleveland Open Cup method. With a nominal value of 258°C, this high quality standard should be used to verify system functionality and assure accuracy of laboratory test equipment on a regular basis.

Manufactured to ASTM D92/IP 36, tested and certified at an accredited laboratory, this standard is a time saving, welcome addition to any petroleum testing facility.

Supplied in 80ml bottles. Available as packs of 3 (99882-0), 6 (99883-0) or 12 (99884-0) bottles.

CERTIFICATE OF MEASUREMENT (WORKS)

TECHNICAL DATASHEETS AVAILABLE

DENSITY STANDARDS

DENSITY STANDARDS

- Full compliance to ASTM D1480
- Manufactured under ISO 17025 quality standards
- UKAS Certified
- Supplied in 100 ml bottles
- Tamper evident packaging for security and proof of integrity
- Valid for 2 years

CALIBRATION CERTIFICATE (UKAS)

DENSITY g/ml

Seta Part No.	Density @ 20°C
12600-001	0.8720
12600-002	0.8540
12600-003	0.8200

STORAGE CABINETS

99970-0 FIRE RESISTANT STORAGE CABINET (T90)

99975-0 FIRE RESISTANT STORAGE CABINET (T90)

CE EN 14470-1 Type 90; RINA Non-combustibility

- Certified Fire Resistant for 90 minutes
- Automatic hydraulic door closing
- Rock wool insulation (800°C)

Certified fire-resistant cabinets for sample storage. Heavy steel construction with automatically closing doors, and rock wool insulation.

FIRE CERTIFICATE (WORKS)

99975-0

99970-0

SPECIFICATIONS

Seta Part No:	99970-0	99975-0
Fire Resistance: (internal temp)	<180°C for 90min	<180°C for 90min
Size (HxWxD):	195 x 59 x 60cm	70 x 59 x 50cm
Weight:	210kg	90kg

Items in *italics* are consumables

Part Number		Page
00100-0	**Setalert Laboratory Radio Paging System**	**142**
00100-001	Setalert Transmitter	
00100-002	Setalert Receiver	
00100-003	Setalert Receiver Charging Unit	
10000-0	**Thin Film Apparatus**	**93**
10000-001	Glass Pump Body	
10000-002	Stainless Steel Pump	
10000-003	Aniline Sample Container	
10000-004	Cover Assembly	
10000-005	Lamp 6.5V (pack of 10)	
10000-006	Pulley Belt (pack of 5)	
10200-005	Spoutless Beaker 600ml (pack of 5)	
10160-0	**Glassware for Aniline Point Methods**	**93**
10160-001	Iron Wire Stirrer & Cork	
10400-0	**Smoke Point Apparatus**	**20**
10400-001	Candle	
10400-002	Wick (pack of 100)	
10400-003	Lamp Glass/Locking Ring	
10400-004	*Wick Tube Assembly*	
10425-0	**Wick Extraction Apparatus**	**20**
10425-001	Soxhlet Extractor	
21200-001	Condenser (pack of 2)	
24401-0	Glass Flask 500ml	
10510-0	**Adlake Burning Test Lamp**	**21**
10510-001	Glass Chimney (pack of 6)	
10510-002	Wick 19mm wide (pack of 50)	
10510-003	Burner Assembly	
10510-004	Oil Container	
10600-0	**Four Way Conradson Test Unit**	**85**
10600-001	Skidmore Iron Crucible (pack of 2)	
10600-002	Spun Iron Crucible (pack of 2)	
10600-003	Nichrome Wire Support (pack of 2)	
10600-004	Spun Steel Hood (pack of 2)	
10600-005	Spun Steel Insulation Block	
10600-006	Stand for Four-Test Unit	
10610-0	**Conradson Test Unit**	**85**
10600-001	Skidmore Iron Crucible (pack of 2)	
10600-002	Spun Iron Crucible (pack of 2)	
10600-003	Nichrome Wire Support (pack of 2)	
10600-004	Spun Steel Hood (pack of 2)	
10600-005	Spun Steel Insulation Block	
10610-001	Tripod Stand (pack of 2)	
11010-2	**Cloud & Pour Point Bath**	**51**
11000-001	Metal Jacket (pack of 2)	
11000-002	Graduated Jar with cork (pack of 10)	
11000-003	Insulating Gasket (pack of 20)	
11000-004	Insulating Disc (pack of 20)	
11200-5	**Rust Prevention Test Bath**	**78**
11200-005	*Beaker 400ml (pack of 10)*	
11200-501	Drive Belts (pack of 6)	
11200-502	Motor	
11200-503	*Stirrer (pack of 2)*	
11225-0	*Synthethic Sea Water Solution*	
11227-0	*Synthethic Sea Water Solution*	
15155-006	Fuse (pack of 5)	
15155-201	Heater	
15155-204	Power PCB	
16155-303	Temperature Probe	
16155-402	Stirrer Motor	
16155-405	Display PCB	
16155-406	Overtemperature Cut-out	
11220-0	**Vertical Test Specimen**	**79**
11220-001	Test Specimen (pack of 5)	
11220-002	Holder Acrylic (pack of 5)	
11220-003	Beaker Cover (pack of 2)	
11300-0	**Copper Corrosion Bath**	**75**
15155-006	Fuse (pack of 5)	
15155-201	Heater	
15155-202	Stirrer Motor	
15155-204	Power PCB	
15155-205	Display PCB	
11305-0	**Copper Corrosion Bath**	**75**
15155-006	Fuse (pack of 5)	
15155-201	Heater	
15155-202	Stirrer Motor	
15155-204	Power PCB	
15155-205	Display PCB	
16155-303	Temperature Probe	
11400-6	**Copper/Silver Corrosion Bath**	**74**
11400-601	Heater	
11400-602	Power PCB	
11400-603	Display PCB	
11400-604	Fuse (pack of 5)	
11400-605	Lid (for 11400-6 Bath)	
16155-303	Temperature Probe	
16155-402	Stirrer Motor	
16155-406	Overtemperature Cutout	
11430-0	**Glassware Silver Corrosion**	**76**
11430-001	Oil Test Tube 350ml	
11430-002	Cold Finger Condenser & Hook	
11430-003	Glass Cradle	
11500-0	**Copper Corrosion Test Vessel**	**51, 76**
11500-001	O Ring Seal (pack of 30)	
11600-0	**Petrolatum Drop Point Apparatus**	**55**
10200-005	*Spoutless Beaker 600ml (pack of 5)*	
11600-001	*Cup Brass (pack of 5)*	
11600-002	Sleeve and Case (pack of 2)	
11600-003	*Thermometer IP40C with Sleeve & Case*	
11600-004	*Thermometer IP41C with Sleeve & Case*	
11600-005	*Boiling Tube (pack of 10)*	
11610-0	**Pharmacopoeia Drop Point Apparatus**	**55**
11610-001	*Thermometer, Sleeve & Case*	
11610-002	*Cup Brass (pack of 5)*	
11610-003	*Beaker Spoutless 1 litre (pack of 5)*	
11610-004	*Boiling Tube (pack of 10)*	
11700-0	**Lubricating Drop Point Apparatus**	**55**
10200-005	*Beaker Spoutless 600ml (pack of 5)*	
11700-001	*Cup Brass (pack of 5)*	
11700-002	*Test Tube & Rod (pack of 10)*	
11730-2	**Grease Drop Point Oven**	**56**
11700-001	Cup Brass (pack of 5)	
11730-001	Heater Cartridge 750W	
11730-002	*Lamp 130V (pack of 5)*	
11730-203	Temperature Controller	
11730-204	*Thermocouple (pack of 10)*	
11740-001	*Test Tube & Rod (pack of 10)*	
11800-0	**Distillation Unit**	**29**
11800-005	Top Board	
11800-006	Viewing Window	
11850-001	Heater 1000W	
11869-001	Condenser Cleaning Tool (pack of 5)	
11869-002	Boiling Stones (pack of 3)	
11870-001	Heat Controller	
11860-3	**Setastill**	**28**
11860-006	Viewing Window	
11860-204	Heater 1000W	
11860-207	Energy Regulator	
11869-001	Condenser Cleaning Tool (pack of 5)	
11869-002	Boiling Stones (pack of 3)	
11870-001	Heat Controller	
17400-007	Mains Lead	
11900-0	**Asphalt Distillation Unit**	**31**
11900-001	Shield	
11900-002	Chimney	
11900-003	Cover	
11900-004	Chimney Support	
11900-005	Nichrome Wire Support (pack of 2)	
11910-0	**Glassware**	**31**
11910-001	*Distillation Flask (pack of 2)*	
11910-002	Condenser (pack of 2)	
11910-003	Adaptor Spout (pack of 2)	
11910-004	*Receiver-Crow type (pack of 2)*	
12200-3	**Existent Gum Solid Block Bath**	**87**
12200-002	Conical Air Outlet Adaptor	
12200-003	Beaker 100ml (pack of 20)	
12200-004	Flow Gauge Uncalibrated	
12200-301	Digital Temperature Controller	
12200-302	Heater	
12200-305	Temperature Probe	
12200-306	Overtemperature Cutout	
12310-3	**Steam Generator**	**87**
12310-301	Heater Element & Gasket	
12310-302	Safety Valve	
12310-303	Pressure Switch	
12310-304	Feedwater Pump	
12600-0	**Portable Density Measurement Kit**	**135**
12600-001	*Density Standard 100ml*	
12600-002	*Density Standard 100ml*	
12600-003	*Density Standard 100ml*	
13032-3	**Abel Flash Point Tester**	**18**
13000-004	Cup	
13000-005	Lid & Shutter Assembly with Stirrer	
13032-301	Thermometer IP74C with collar (pack of 2)	
13032-302	Thermometer IP75C with collar (pack of 2)	
13220-2	**Tag Closed Cup Tester**	**17**
11870-001	Heat Controller	
13220-002	*Brass Test Cup*	
13220-003	Lid & Shutter Assembly	
13220-004	Thermometer Collar (pack of 10)	
13730-005	*Silicone Rubber Tube 4 metres*	
13811-001	Hot Plate	
13230-3	**Semi-Automatic Tag Open Cup Tester**	**17**
11870-001	*Heat Controller*	
13220-004	Thermometer Collar (pack of 10)	
13230-002	*Glass Sample Test Cup*	
13230-004	Levelling Device	
13730-005	*Silicone Rubber Tube 4 metres*	
13800-003	Thermometer Clip	
13811-001	Hot Plate	
13811-002	Test Flame Applicator	
13661-3	**Pensky-Martens Closed Cup Tester**	**18**
11870-001	Heat Controller	
13400-002	Brass Test Cup	
13400-004	Thermometer Collar (pack of 10)	
13420-001	Heat Assembly Band & Base Heater	
13661-002	Flexi-drive Inner Cable	
13661-003	Lid-Shutter-Stirrer with Jet	
13661-301	*Pensky-Martens Cup*	
13661-303	Lid & Shutter	
13730-005	*Silicone Rubber Tube 4 metres*	
22100-002	Gasket (pack of 10)	
13663-0	**Setaramp Controller**	**19**
13663-001	Circuit Board Assembly	
13663-003	Temperature Probe Holder	
13663-004	Heat Sink Assembly	
13663-005	Eprom	
15450-001	Indicator Assembly	
13811-3	**Semi-Auto. Cleveland Open Cup Tester**	**19**
11870-001	Heat Controller	
13230-201	Motor Assembly	
13730-005	*Silicone Rubber Tube 4 metres*	
13800-001	*Test Cup*	
13800-003	Thermometer Clip	
13811-001	Hot Plate	
13811-002	Test Flame Applicator	
14020-5	**Setafoam Dual Twin Foam Test Baths**	**102**
14000-002	*Graduated Cylinder (pack of 2)*	
14000-003	Test Bath, Borosilicate Glass	
14020-403	*Dichroic Lamp (pack of 4)*	
14020-505	Clamp Ring	
14020-406	Flowmeter	
15155-006	Fuse (pack of 5)	
15155-201	Heater	
15155-202	Stirrer Motor	
15155-205	Display PCB	
15166-206	Fuse (pack of 5)	
16155-303	Temperature Probe	
14028-4	**Verification Kit - Foam**	**103, 149**
14028-201	Digital Manometer	
14028-202	*Flask 250ml Glass*	
14028-203	*Cylinder 250ml Glass*	
16720-002	*Silicone Rubber Tube 5 metres*	
14030-2	**Air Pump**	**136**
14031-0	**Air Pump**	**136**
14030-201	Stand by Spares Kit	
14060-0	**Twin-Column Adsorption Apparatus**	**92**
14060-001	Ultra-Voilet Fluorescent Tube	
14060-901	Scale & Cursors (pair)	
14060-902	Cursors (pack of 4)	
14090-903	Measuring Scale Assembly	
14080-0	**Standard Adsorption Column**	**92**
13730-005	Silicone Rubber Tube 4 metres	
14080-001	Analyser Section (pack of 100)	
14080-002	Charger Section Standard (pack of 2)	
14080-003	Ball Joint Section (pack of 2)	
14090-003	Ball Joint Clip (pack of 5)	
14090-0	**True Bore Adsorption Column**	**92**
14080-003	Ball Joint Section (pack of 2)	
14090-001	Tip (pack of 2)	
14090-002	Charger/Separator/Analyser Section (pack of 2)	
14090-003	Ball Joint Clip (pack of 5)	
14090-004	Tip Joint Clip (pack of 5)	
14300-3	**Dual Extraction Apparatus**	**94**
11200-005	Beaker 400ml (pack of 10)	
11870-001	Heat Controller 110/120V only	
14300-001	Heat Controller 220/250V only	
50000-005	Temperature Indicator Assembly	

Part Number		Page
14310-0	**Extraction Glassware**	**94**
14310-001	Boiling Flask 500ml c/w heat tube	
14310-002	Reflux Condenser	
14310-003	Thistle Tube Graduated at 50ml	
14310-004	Gooch Crucible 25ml	
14700-0	**Copper Sampling Can 1 litre**	**121**
14710-0	**Copper Sampling Can 500ml**	**121**
14720-0	**Tinned Steel Sampling Can 1 litre**	**121**
14730-0	**Tinned Steel Sampling Can 500ml**	**121**
14750-0	**Copper Sampling Can 1.5 litre**	**123**
14700-001	Cork with Brass Screw & Washer Assembly (pack of 5)	
14760-2	**Sampling Cage**	**122**
14760-001	Cork with Brass Screw & Washer Assembly (pack of 5)	
15155-2	**Thermostir**	**138**
15155-006	Fuse (pack of 5)	
15155-201	Heater	
15155-202	Stirrer Motor	
15155-204	Power PCB	
15155-205	Display PCB	
16155-303	Temperature Probe	
15200-5	**RoBOT Bath**	**64**
14025-005	Temperature Control Board	
15200-302	Heatsink Assembly	
15200-303	Temperature Probe Assembly	
15200-305	Heater Gasket	
15200-308	*Nylon Bearing (pack of 2)*	
22600-003	Thermometer Collar (pack of 2)	
22800-001	Heater	
50000-005	Temperature Indicator	
15205-2	**AutoRoBOT Pressure Monitoring System**	**65**
15205-001	Pressure Control PCB	
15205-003	Rotating Inductive Link	
15205-004	Serial Chainer PCB	
15205-201	*Link Lead Assembly*	
15205-202	Lead Chasis to Head	
15205-203	Link Lock Assembly	
15205-050	Seta RoBot Software	
15450-001	Pressure Indicator Assembly	
83545-007	Computer Interface Lead	
15210-5	**RoBOT Oxidation Vessel**	**64**
15210-401	*O Ring Seal (pack of 10)*	
21560-401	Right Angled Valve	
15220-0	**Glass Liner & PTFE Cover**	**64**
15220-001	ASTM Cover (pack of 10)	
15220-002	Spring (pack of 5)	
15221-0	**Accessory Kit for ASTM D4742**	**64**
15221-001	Glass Container & PTFE Cover (pack of 2)	
15250-4	**Colour Comparator**	**114**
15250-202	*Sample Container (pack of 5)*	
15250-301	*Halogen Lamp 20W*	
15250-401	*White Insert Replacements (pack of 3)*	
15260-4	**Multicolour Automatic Colorimeter**	**112**
15260-301	*Lamp, 5V, 10W, lens ended*	
15260-303	*Optical Glass Cell 33mm (ASTM D1500)*	
15260-304	*Optical Glass Cell 50mm (ASTM D156)*	
15311-2	**Saybolt Universal Chromometer**	**113**
15311-202	*O Ring, Viton (pack of 5)*	
15311-204	*Bulb 60W (pack of 2)*	
15311-206	*Gasket for Tube (pack of 12)*	
15320-2	**High Precision Colorimeter**	**112**
15260-301	*Lamp, 5V, 100W, lens ended*	
15260-303	*Optical Glass Cell 33mm (ASTM D1500)*	
15320-001	*Optical Glass Cell 100mm (Pt-Co/Hazen/Alpha/Saybolt)*	
15320-003	*Optical Glass Cell 6 inch (IP Units)*	
15320-004	*Optical Glass Cell 10mm (Gardner)*	
15400-4	**Oxidation Stability Console Bath**	**66**
15400-001	Immersion Heater	
22600-003	Thermometer Collar (pack of 2)	
15450-3	**Auto Oxidation Control Unit**	**67**
15205-001	Pressure Control PCB	
15450-001	Pressure Indicator Assembly	
15455-0	**Transducer**	**67, 68**
15455-002	Lead for Transducer	
15455-003	O Ring Viton/PTFE (pack of 3)	
15550-2	**Oxi-Cor Bath**	**68, 74**
11400-601	Heater	
11400-602	Power PCB	
11400-603	Display PCB	
11400-604	Fuse (pack of 5)	
16155-303	Temperature Probe	
16155-402	Stirrer Motor	
16155-406	Overtemperature Cutout	
15611-0	**Portable Cambridge Pressure Recorder**	**67**
15610-001	Recorder Charts psi (pack of 100)	
15610-002	Ink Capsules Red (pack of 5)	
15610-003	Pen Arms (pair)	
15610-004	Ink Capsules Green (pack of 5)	
15610-005	Recorder Charts kPa (pack of 100)	
15640-001	Neoprene Washer (pack of 50)	
15650-0	**Water Purifier**	**61, 66, 68, 76, 87, 102, 137**
15650-001	Cartridge	
15800-4	**Oxi-Feed Pressure Vessel**	**66, 68**
15800-201	O Ring Seal (pack of 10)	
21560-302	Seal 1/8 inch BSP (pack of 5)	
21560-401	Right-Angled Valve	
21810-0	Coupling, Male Schrader	
15802-0	**Oxidation Vessel**	**66**
15800-201	O Ring Seal (pack of 10)	
15801-001	Burst Disc Assembly	
21560-302	Seal 1/8 inch BSP (pack of 5)	
21560-401	Right-Angled Valve	
21810-0	Coupling, Male Schrader	
15810-0	**Liner (pack of 3)**	**66**
15810-001	Glass Cover for liner (pack of 10)	
15810-002	Liner (pack of 3)	
15850-4	**Air Release Value Apparatus**	**104**
15850-002	Grommet (pack of 5)	
15850-003	Heater Plate Assembly	
15850-004	Pressure Gauge	
50000-001	Main PCB Assembly	
50000-002	Heatsink PCB/Triac Assembly	
50000-003	Temperature Probe & Socket	
50000-004	Connector Lead	
50000-005	Temperature Indicator	
15870-4	**Circulating Water Bath**	**104**
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15155-201	Heater	
15155-204	Power PCB	
16155-303	Temperature Probe	
16155-402	Stirrer Motor	
16155-405	Display PCB	
16155-406	Overtemperature Cutout	
15880-6	**Density Balance**	**104**
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15881-002	Balance to Computer Lead	
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16120-004	Buchner Flask Assembly 500ml	
16120-005	Sintered Disc (pack of 2)	
16120-006	Vacuum Gauge	
16120-007	Vacuum Hose 5 metres	
16120-008	Spherical Joint Stop & Clip (pack of 5)	
16120-009	Cylindrical Weighing Bottle	
16120-010	Left Hand Valve	
16120-011	Right Hand Valve	
16720-002	Silicone Rubber Tube 5 metres	
16125-0	**Digital Thermometer & Probe**	**86, 104**
16125-001	Thermocouple Type K	
16130-3	**Steam Generator**	**137**
16130-203	Silicone Rubber Tube	
16130-301	Heater	
16155-4	**Fuel Oil Ageing Bath**	**86**
15155-006	Fuses (pack of 5)	
15155-201	Heater	
15155-204	Power PCB	
16155-005	Air Well	
16155-303	Temperature Probe	
16155-402	Stirrer Motor	
16155-405	Display PCB	
16155-406	Overtemperature Cutout	
16155-407	Propeller (pack of 3)	
16160-2	**SSAFCON Sampler**	**82**
16160-005	Pressure Control Valve	
16160-009	Quick-connect, Female	
16160-202	Flowmeter	
16160-203	Pressure Gauge	
16160-204	By-Pass Valve	
16160-207	High Pressure Hose	
16160-208	Seal Replacement Kit	
22100-002	Gasket (pack of 10)	
16165-2	**Mounting Tray**	**82**
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16400-3	**Oxidation Pres. Cyl. (Norma Hoffman)**	**69**
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16400-001	*Lead Gasket (pack of 20)*	
21560-401	Right Angled Valve	
16500-0	**Demulsification Apparatus**	**103**
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16500-002	Separating/Emulsifying Bath (pack of 2)	
16500-003	Cover for Baths (pair)	
16500-004	Oil Container (pack of 2)	
16500-005	Set of Tubes & Tubing	
16600-2	**Hightemp Bath - Universal Oxidation**	**70**
16620-2	**Hightemp Bath - 12 Way**	**71**
16600-001	Band Heater	
16600-002	Insulation Kit for Heater	
16600-003	Glassware Support Bracket (pair)	
16600-004	Thermal Cut-out	
16600-005	Probe	
16600-006	Nylon Tubing	
16600-007	Seal & Stop Kit (pack of 6)	
16600-008	Pressure Gauge	
16600-009	Regulator	
16600-010	Relief Valve & Cap	
16600-011	Temperature Controller	
17400-007	Mains Lead	
50000-003	Temperature Probe Assembly	
50000-004	Connecting Lead	
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16771-0	**Glassware**	**71**
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22400-003	O Ring to support Adsorption Tube (pack of 20)	
16840-0	**Glassware**	**71**
16720-002	Silicone Rubber Tubing 5 metres	
16840-001	Test/Absorption Tube (pair)	
22400-003	O Ring to support Adsorption Tube (pack of 20)	
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16860-004	Condenser 24/40 Cone	
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15155-201	Heater	
15155-204	Power PCB	
16155-303	Temperature Probe	
16155-402	Stirrer Motor	
16155-405	Display PCB	
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17000-002	Weight 100g	
17000-003	Plunger 47.5g	
17000-004	Socket Wrench 1/8 inch a/f	
17500-0	**Setamatic Penetrometer**	**58**
17000-001	Weight 50g	
17000-002	Weight 100g	
17000-003	Plunger 47.5g	
17000-004	Socket Wrench 1/8 inch a/f	
17500-002	Display PCB & Keypad	
17500-003	Sensor Board Assembly	
17500-004	Sensor Drive Motor	
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17500-006	Counterbalance Spring	
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17510-002	Seal for Plunger (pack of 5)	
17800-001	Worker Plate	
17800-002	Churn Plate	
17790-0	**Stanomatic Dual Grease Worker**	**62**
17510-001	Brass Worker Pot	
17510-002	Seal for Plunger (pack of 5)	
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17790-002	Drive Shaft & Keys	
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17800-002	Churn Plate	
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15155-201	Heater	
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15155-204	Power PCB	
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16155-303	Temperature Probe	
19400-3	**Roll Stability Tester**	**63, 100**
14025-006	PRT Probe	
15153-004	Motor & Fan	
19400-005	Drive Belt	
19400-006	Roller Motor & Gearbox	
19400-307	Collar & Bearing (pack of 8)	
19400-308	Thermometer Collar (pack of 2)	
19400-309	O Rings (pack of 12)	
19420-0	**Cylinder**	**63, 100**
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19610-4	**Water Washout Tester**	**100**
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19610-203	Pump	
19610-204	Temperature Controller	
19610-205	Probe Assembly	
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19720-002	Vacuum Filtering Flask	
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19722-001	Filters, matched weight pairs, 0.8 micron, 47mm diameter	
19722-002	Vacuum Filtering Flask	
19722-003	Filter Holder, 47mm	
19722-004	Forceps	
19722-005	Solvent Dispenser	
19722-006	Petrislide	
19724-0	**Filtration Kit**	**82**
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19800-007	Cam Spindle	
19800-008	Socket (pack of 2)	
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19800-011	Locking Ring	
19800-014	Bearing Plate	
19800-016	Disc	
19800-017	Plunger Head	
19800-018	Bearing Plug	
19800-019	Bearing Pin	
19800-020	Retaining Plate	
19800-021	Vee Block, Matched Pair	
19800-022	Knife Edge Bearing	
19800-023	Lever Arm	
19800-024	*Thrust Race - Plunger Head*	
19800-025	*Thrust Race - Bearing Hub*	
19800-026	Ball Race Bearing Hub (set of 2)	
19800-034	Sliding Cursor	
19800-035	Set of Weights	
19800-036	*Ball Chuck*	
19800-213	Torque Arm with Holding Ring	
19800-227	Bearing Hub & Ball Holder Housing	
19810-001	*Ball Race*	
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19800-007	Cam Spindle	
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19800-011	Locking Ring	
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19800-014	Bearing Plate	
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19800-020	Retaining Plate	
19800-021	Vee Block, Matched Pair	
19800-022	Knife Edge Bearing	
19800-024	*Thrust Race - Plunger Head*	
19800-025	*Thrust Race - Bearing Hub*	
19800-026	Ball Race Bearing Hub (set of 2)	
19800-034	Sliding Cursor	
19800-035	Set of Weights	
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20480-012	Kilner Jar (Trap) 500ml	
20460-0	**Synthetic Air Unit**	**97**
11870-003	Thermometer Dial Type	
20460-002	Heater Element	
20460-003	Flowmeter 150-1500 l/hr carbon dioxide	
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20480-001	Flask (pack of 3)	
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20480-003	Chimney	
20480-004	Absorber	
20480-006	Pressure Regulator	
20480-007	Scrubber	
20480-008	Levelling Bulb (reservoir) (pack of 3)	
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21560-302	Nitrile Seal for 1/8 inch BSP (pack of 5)	
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21520-4	**Sampling Cylinder 50ml**	**119, 123**
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15155-201	Heater	
15155-202	Stirrer Motor	
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22422-604	Oil Sight Glass	
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22422-001	Vacuum Hose 2 metres	
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13740-004	*Sample Well Seal Ring, Viton (pack of 5)*	
13740-009	*Syringe 2ml*	
13740-017	*Heat Sink Compound*	
13740-425	*Flash Detector Assembly*	
13770-004	*Sample Well Seal Ring, Silicone (pack of 5)*	
13770-311	*Syringe 4ml*	
30000-001	Controller PCB	
30000-002	Gas Tank	
30000-003	Closed Cup Sample Block	
30000-004	Front Panel Assembly	
30000-005	Over Temperature Cut Out	
30000-006	Wiring Set	
30000-007	Rubber Feet (set)	
30000-008	Service Screw Set	
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13730-005	*Silicone Rubber Tube 4 metres*	
13740-009	*Syringe 2ml*	
13740-017	Heat Sink Compound	
13770-311	Syringe 4ml	
30000-002	Gas Tank	
30000-004	Front Panel Assembly	
30000-005	Over Temperature Cut Out	
30000-006	Wiring Set	
30000-007	Rubber Feet (set)	
30000-008	Service Screw Set	
31000-001	Controller PCB	
31000-002	Closed Cup Sample Block	
80000-024	Fuse 2A (pack of 10)	
33000-0	**Series 3 Plus Closed Cup Tester**	**13**
13730-005	*Silicone Rubber Tube 4 metres*	
13740-004	*Sample Well Seal Ring, Viton (pack of 5)*	
13740-009	*Syringe 2ml*	
13740-017	*Heat Sink Compound*	
13740-425	*Flash Detector Assembly*	
13770-004	*Sample Well Seal Ring, Silicone (pack of 5)*	
13770-311	*Syringe 4ml*	
30000-002	Gas Tank	
30000-003	Closed Cup Sample Block	
30000-004	Front Panel Assembly	
30000-005	Over Temperature Cut Out	
30000-006	Wiring Set	
30000-007	Rubber Feet (set)	
30000-008	Service Screw Set	
30000-009	Locking Post for Lid	
33000-001	Controller PCB	
70000-001	Lid & Shutter Assembly	
80000-024	Fuse 2A (pack of 10)	
33200-2	**Series 3 Active Cool**	**12**
13730-005	*Silicone Rubber Tube 4 metres*	
13740-004	*Sample Well Seal Ring, Viton (pack of 5)*	
13740-009	*Syringe 2ml*	
13740-017	*Heat Sink Compound*	
13740-425	*Flash Detector Assembly*	
13770-004	*Sample Well Seal Ring, Silicone (pack of 5)*	
13770-311	*Syringe 4ml*	
30000-002	Gas Tank	
30000-004	Front Panel Assembly	
30000-007	Rubber Feet (set)	
30000-008	Service Screw Set	
30000-009	Locking Post for Lid	
33200-201	Controller PCB	
33200-202	Closed Cup Sample Block	
33200-203	Over Temperature Cut Out	
33200-204	Wiring Set	
70000-001	Lid & Shutter Assembly	
80000-024	Fuse 2A (pack of 10)	
33250-2	**Series 3 Active Cool (Corrosion Resisting)**	**12**
13730-005	*Silicone Rubber Tube 4 metres*	
13740-004	*Sample Well Seal Ring, Viton (pack of 5)*	
13740-009	*Syringe 2ml*	
13740-017	*Heat Sink Compound*	
13740-425	*Flash Detector Assembly*	
13770-004	*Sample Well Seal Ring, Silicone (pack of 5)*	
13770-311	*Syringe 4ml*	
30000-002	Gas Tank	
30000-004	Front Panel Assembly	
30000-007	Rubber Feet (set)	
30000-008	Service Screw Set	
30000-009	Locking Post for Lid	
33250-201	Controller PCB	
33250-202	Closed Cup Sample Block	
70000-001	Lid & Shutter Assembly	
80000-024	Fuse 2A (pack of 10)	
34000-0	**Multiflash Base Unit**	**2**
34000-001	DIPS Control Cable	
34000-002	Ignitor Power Cable	
34000-003	Electronics Assembly	
34000-004	Base Heater	
34000-005	Cooling Fan	
34000-006	Main Switch	
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34100-001	*Flash Detector*	
34100-002	*Sample PRT*	
34100-003	Test Cup	
34100-004	*Ignitor*	
34100-005	Lid & Shutter Assembly	
34100-009	Air Blast Pipe	
34100-010	Stirrer Flexible Drive Shaft	
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81002-201	*Printer Paper (pack of 20)*	
34200-0	**Multiflash Abel Module**	**5**
34100-002	*Sample PRT*	
34100-012	Hexagonal Key Set	
34200-003	*Abel PRT (IP 70)*	
34200-004	Equilibrium PRT (ISO 1516 & 1523)	
34200-005	*Ignitor*	
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34200-007	Sample Cup	
34700-001	*Flash Detector*	
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34100-004	*Ignitor*	
34300-001	*Ionisation Ring*	
34300-002	*Sample PRT*	
34300-003	Hotplate PRT	
34300-004	Fire Sensor Probe	
34300-005	Test Cup	
34300-006	Insulator Ring	
34300-008	Probe Block	
34300-009	Hexagonal Key Set	
34300-010	Sweep Arm Height Gauge (Electric)	
34300-011	Cleveland Height Gauge	
34300-012	Sweep Arm Height Gauge (Gas)	
34301-001	Hussami Filter Papers (pack of 50)	
81002-201	*Printer Paper (pack of 20)*	
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34100-012	Hexagonal Key Set	
34400-002	*Sample PRT*	
34400-003	*Bath PRT*	
34400-005	*Ignitor*	
34400-006	Lid & Shutter Assembly	
34400-009	Overflow Vessel	
81002-201	*Printer Paper (pack of 20)*	
34700-0	**Multiflash Small Scale Setaflash Module**	**8**
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13770-004	*Sample Well Seal Ring, Silicone (pack of 5)*	
34100-012	Hexagonal Key Set	
34200-005	*Ignitor*	
34700-001	*Flash Detector*	
34700-002	Lid & Shutter Assembly	
81002-201	*Printer Paper (pack of 20)*	
71001-0	**Seta-Vent**	**19**
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17400-007	Mains Lead	
22420-005	O Ring Vacuum Pipe Seal (pack of 10)	
22420-006	O Ring Transducer Seal	
22420-014	Temperature Probe	
40000-002	Printer PCB	
40000-004	Mother PCB	
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80000-001	Interface PCB	
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80000-015	Fan 12V for Cabinet	
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80000-017	*Flask - Used Sample (pack of 5)*	
80000-018	Temperature Probe	
80000-019	Flexible Hose Vacuum Inlet to Ball Valve	
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81002-201	Printer Paper (pack of 20)	
81003-0	*Syringe, 5ml & needles*	
81003-001	*Syringe, 5ml c/w LeurLock*	
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82000-004	Keypad Gasket	
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Terms and conditions

1 General

All quotations are made and orders accepted by Stanhope-Seta in accordance with the following Terms. Should you find any matters about which you are not happy – please tell us and we will do our best to resolve any queries.

2 Specifications

Published specifications and product details are subject to amendment as a result of necessary or desirable updating or improvement. If these are considered to be of consequence we shall endeavour to advise the customer and reserve the right to supply goods to the specification and/or design current at the date of despatch. Goods and services are supplied under our ISO 9001 Quality accreditation.

3 Quotations, acceptance and delivery

Prices and delivery details are correct at the time of quotation and may be subject to amendment or to confirmation at the time of receipt of order. No liability is accepted for any amendment. Whilst every effort is made to meet delivery dates, these are estimates only. No liability is accepted for delays and time is not of the essence.

After acceptance of a firm order, we are under no obligation to accept amendments or cancellations but will at all times endeavour to meet customers revised wishes. Details of our minimum order value are stated in our current price list.

4 Prices, packing and freight

Unless otherwise specified by us, all prices are ex-works and packed suitable for airfreight. Value Added Tax will be charged where applicable.

The date of invoicing is the date when goods leave our factory or when the customer is notified that they are ready for collection. If goods are ready for delivery and collection as agreed, but goods are not called forward after 14 days notification, they may be subject to demurrage charges.

We are pleased to quote costs for freight, insurance, certification and documentation. Transport of hazardous materials may involve additional cost.

5 Insurance

5a) Goods delivered to United Kingdom destinations are covered by our transit insurance, but subject to an excess policy. Claims will only be considered in cases where the value of the claim exceeds 1000.00 pounds sterling. Both the carriers and ourselves must be advised within 24 hours of receipt of goods in respect of shortages or breakages, or, in the event of non-delivery, within 28 days from invoice date.

5b) Insurance for goods for Export will be arranged by us and charged to the customer, unless specifically agreed otherwise, but subject to an excess policy. Claims will only be considered in cases where the value of the claim exceeds 1000.00 pounds sterling. Both carriers and ourselves must be advised within 24 hours of receipt of goods in respect of shortages or breakages, or, in the event of non-delivery, within seven days from despatch by air or within 10 days of expected date of arrival by sea.

5c) No liability is accepted in respect of any loss, or damage caused by, or consequent upon delay in delivery or non-delivery from any cause whatsoever. In particular, deliveries offered ex-stock are subject to the goods being unsold at the time of receipt of order.

6 Payment

Payments may be made by Advance Payment, Visa or Mastercard credit cards, or on terms of an Approved Credit Account. To accommodate standard export terms, Cash Against Documents or Letters of Credit, may also be used. Our sales order processing team will gladly provide additional details.

All documents are in Pounds Sterling unless stated to the contrary. Invoices submitted on the basis of an Approved Credit Account are due for payment within 30 days of invoice date. The right is reserved to charge interest on overdue accounts at a rate equivalent to 4% above the applicable statutory default interest rate.

7 Warranty

We warrant that SETA equipment will be free from defects of workmanship, design or materials for a period of 18 months from the date of leaving our factory.

SetaPlus Extended Warrantiy is available for many SETA instruments, please refer to our catalogue or website for details.

During the warranty period we have the options either to repair or to replace faulty equipment. Please refer to us before returning goods in query under warranty, giving full details. Whilst every possible effort will be made to give complete satisfaction, our decision is final.

Not withstanding the above warranty, Stanhope-Seta will have no liability to repair or replace goods or to compensate the customer:

(i) as a result of defects arising from fair wear and tear, including bearings, seals, switches and any other components which due to their nature have moving parts that under certain operating conditions may have an effective working life of less than the standard warranty period;

(ii) if the equipment is not used in accordance with the design specifications and the installation and operating instructions;

(iii) if there is any attempt to eliminate a possible or actual malfunction without our consent. Please refer to us for specific recommendations;

(iv) if SETA instruments are used in conjunction with equipment not recommended by us. Please refer;

(v) in the case of Accessories or Spares which might be expected to need replacement within the period or;

(vi) in the case of anything not of our manufacture. Any warranty by manufacturers of instruments, apparatus or components supplied to us and capable of assignment will be passed on to our customers under the terms specified.

In any event Stanhope-Seta shall in no circumstances be liable, in contract, tort (including negligence or breach of statutory duty) or otherwise howsoever, and whatever the cause thereof for any increased costs or expenses; any loss of profit, business, contracts, revenues, anticipated savings; or any special indirect or consequential damage of any nature whatsoever.

8 Liability and indemnity

Save for liability for death of a human or personal injury arising from Stanhope-Seta's negligence, our liability for any and all direct loss or damage resulting from defects in product or any other cause shall be limited to a maximum of the purchase price paid for the goods in respect or in relation to which such loss or damage is claimed.

The customer shall indemnify and hold harmless Stanhope-Seta in respect of all damage or injury occurring to any person, business or property and against all actions, suits, claims and demands, charges or expenses in connection therewith for which the customer may become liable in respect of the goods sold under contract in the event that the damage or injury shall have been occasioned otherwise than by the negligence of Stanhope-Seta.

Where Stanhope-Seta manufactures goods to the customer's specification or designs goods to the customer's order the customer will indemnify Stanhope-Seta against any claims for infringement of any third party rights in respect of such goods or arising from such manufacture.

9 Legal construction and arbitration

English Law shall apply to all matters in connection with our Terms and with our contract with the customer. Any question or dispute arising which cannot be settled between parties shall be determined by the arbitration under the Rules of London Court of Arbitration.

10 Copyright

Registered trademarks and all intellectual property in any drawings, sketches or literature supplied in connection with quotations, order or equipment remains the property of Stanhope-Seta who reserves the copyright. Reproduction of such material may be permitted subject to credits and our prior agreement.

11 Risk and title of goods

Risk in all goods passes to the customer when the goods leave our factory unless otherwise agreed.

Title to all goods sold shall remain with Stanhope-Seta and shall not pass to the customer until all amounts due in respect of the sale have been paid. If the customer sells the goods, the proceeds of sale shall be held in trust for Stanhope-Seta to the extent that it has not received payment for them in full.

12 Shortages and error

Any claim for shortage or error in consignment must be made promptly after receipt of the goods. We reserve the right to reject any claim made after seven days.

13 Health and safety regulations

It is responsibility of the customer to ensure that all persons involved with equipment supplied by Stanhope-Seta are fully briefed with the relevant instructions for use and with local regulations.

14 Recycling

Provisions for the end of life disposal of goods supplied or replaced as provided for in any regulations including those of the WEEE directive shall be under the Customer's control and cost, unless mutually agreed otherwise in writing.

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